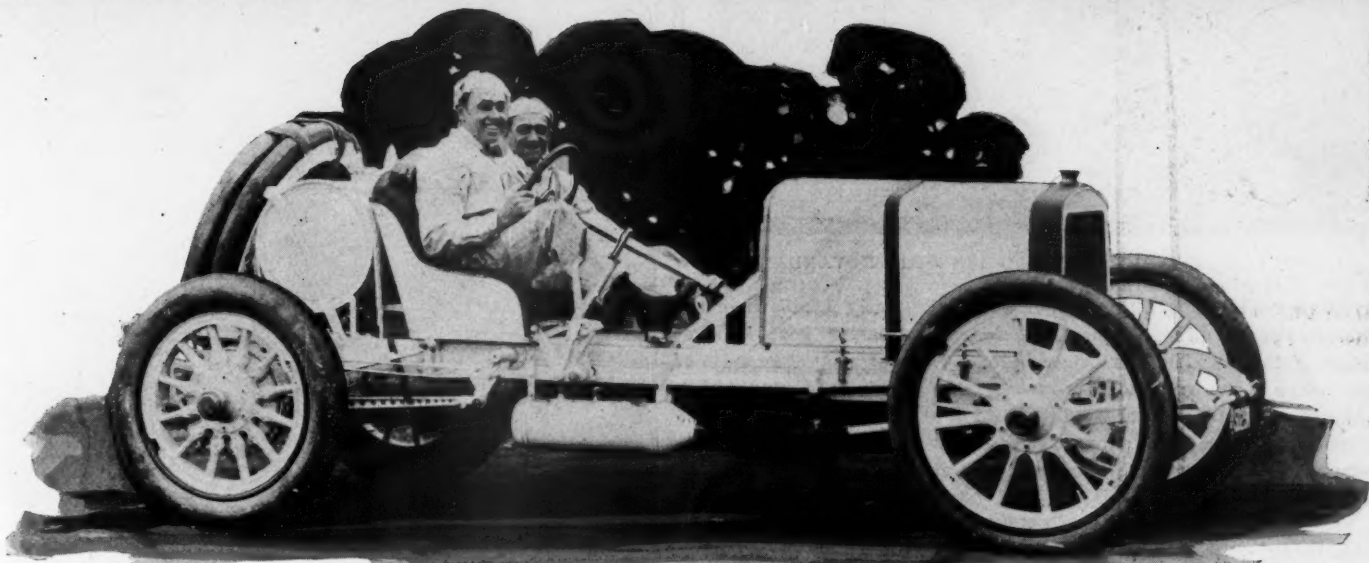


MOTOR AGE



RALPH MULFORD IN HIS VANDERBILT-WINNING LOZIER

Lozier's Name Goes on Vanderbilt Cup

Ralph Mulford Scores Sensational Victory Over Foreigners in Seventh Renewal of American Classic, Averaging 74.07 Miles Per Hour—De Palma Second and Wishart Third—Hughes in Mercer and Witt, E-M-F, Win Small-Car Events



RALPH DE PALMA

Vanderbilt Cup			
Pos. Car	Driver	Time	M. P. H.
1 Lozier	Ralph Mulford	236:00.67	74.07
2 Mercedes	Ralph de Palma	238:11.95	73.39
3 Mercedes	Spencer Wishart	246:20.37	70.97
4 Lozier	Harry Grant	250:23.57	69.82
5 Fiat	E. H. Parker	254:25.88	68.71
6 Pope	L. A. Disbrow	259:02.68	67.49
Savannah Cup.			
1 Mercer	Hugh Hughes	195:37.92	68.34
2 Marmon	L. Heinemann	201:41.49	66.28
3 Marmon	J. Nikrent	204:42.93	65.30
Tiedeman Cup			
1 E-M-F	Frank Witt	179:19.34	57.53
2 E-M-F	Robert Evans	180:12.34	57.06
3 E-M-F	Jack Tower	181:33.84	56.64
4 Ford	Frank Kulick	201:07.50	51.13

SAVANNAH, Ga., Nov. 27—Special telegram.—The Savannah speed carnival, including the Vanderbilt, Savannah challenge, Tiedemann cup and the grand prix, opened today with the first three named races being contested and with the grand prix reserved for a Thanksgiving day attraction. Surprising speed was made, Mulford, in a Lozier winning the Vanderbilt at an average pace of 74.07 miles per hour. Hughes, in a Mercer, won the Savannah challenge cup at 68.34 miles per hour and in the Tiedeman cup the E-M-F ran one, two, three,

Witt, the winner, averaging 57.35 miles per hour.

Ralph Mulford covered the 291.38 miles at an average pace of 74.07 miles per hour, a pace which makes all former Vanderbilt cup marks look small. It is 9 miles per hour faster than any previous race for this American classic and is not much below the famous record recently made by the National on the Santa Monica course, namely, 202 miles at a speed of 74.628 miles per hour.

When the Mulford had covered twelve laps or 205 miles today his



SPENCER WISHART



GRANT, LOZIER, WHO FINISHED FOURTH IN VANDERBILT

average speed was 74.9 miles per hour, or faster than the Santa Monica pace for the same distance. His performance cannot be classed as an intermediate record as he did not announce his intention before the start of the race to go after the record as required by the rules governing official records.

Ralph dePalma, in a Mercedes, was second, being only 2 minutes 11.32 seconds behind the leader, with Wishart in another Mercedes third and Grant in the second Lozier fourth. Fifth place was captured by Parker in a Fiat, the only one of three entered to complete the seventeen laps of the race. Much credit was given to Disbrow in his Pope-Hummer that ended in sixth place. Two Abbott-Detroit cars of medium horsepower were running at the finish. No. 9, driven by Mitchell, having finished sixteen of the seventeen laps when the race was declared off and No. 17, having completed fourteen laps.

Of the fourteen cars that entered, six finished the race, two others were running at the finish and six dropped out due to one trouble or another.

The race was a most spectacular one from start to finish. It came as the big act of the day's program which consisted of three races, two of which, the Savannah

actually 11:45 when the starter got the first car away. In spite of this late start, Mulford had covered the 291.38 miles at a quarter to 4.

The setting for the first running of this New York classic in the south was perfect in every respect. The weather was clear, the sky cloudless, with a fresh breeze making conditions ideal. The big grandstand, seating over 8,000, was well filled, and there were a couple of thousand more in the bleacher stand across the course. The road surface was prepared to the minute. The entire 17.14 miles of the course had been resurfaced and over \$15,000 spent in oiling it. The surface in some places was a little soft, but the pace today was 4 miles per hour faster than that of the grand prize over

and Tiedeman cup races for smaller cars at shorter distances, were staged early in the day, starting at 8 o'clock. The Vanderbilt was not started until these were completed and it was ex-

the same course last year. The course has several turns but all are banked and on some of these cars traveled at as high as 65 miles per hour. On the long stretches the capabilities of the cars constituted the only limit to the speed. The crowds were not all confined to the grandstands, scores of picknicking parties lining the home stretch and other parts that afforded a good view of the racers. The speed made



FRANK WITT, E-M-F, WINNER OF TIEDEMAN CUP

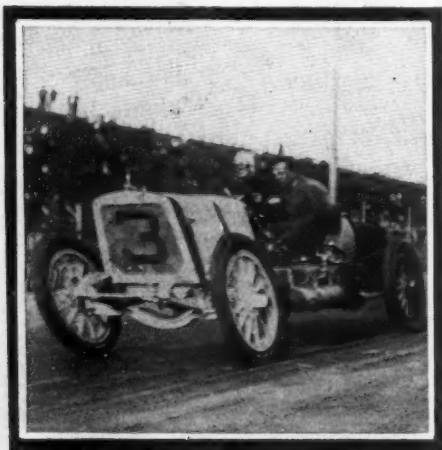
was higher than anticipated. It was freely stated that the pace would be somewhere between 73 and 74 miles per hour, but few expected it to go over 74. It is much faster than any previous Vanderbilt, the times for which as well as the distances are given herewith:

Year	Distance	Speed
1904	284.3	52.2
1905	283.	61.4
1906	297.1	60.8
1907	No race	
1908	258.6	34.3
1909	278.09	62.8
1910	278.08	65.18

The speed of today shows what are the

OFFICIAL RESULTS IN SEVENTH ANNUAL VANDELBILT

No.	Car	Driver	Bore	Stroke	Distance, Miles	17.41	34.28	51.42
8	Lozier	Ralph Mulford	5%	6	Elapsed time	27.33	41.11	
					Lap time	13.48	13.45	13.38
10	Mercedes	Ralph dePalma	5.118	7.086	Elapsed time	26.47	40.03	
					Lap time	13.33	13.14	13.16
4	Mercedes	S. Wishart	5.118	7.086	Elapsed time	27.20	40.55	
					Lap time	13.44	13.36	13.35
1	Lozier	Harry Grant	5%	6	Elapsed time	31.09	48.45	
					Lap time	14.04	17.05	17.36
11	Fiat	E. H. Parker	5	7½	Elapsed time	27.59	43.17	
					Lap time	13.57	14.02	15.18
3	Pope-Hummer	L. Disbrow	4%	5½	Elapsed time	28.56	43.16	
					Lap time	14.32	14.24	14.20
9	Abbott-Detroit	L. A. Mitchell	4½	5½	Elapsed time	32.46	48.57	
					Lap time	16.34	16.12	16.11
7	Abbott-Detroit	C. Limberg	4½	5½	Elapsed time	42.29	59.56	
					Lap time	20.22	22.07	17.27
12	Marmon	Cyrus Patschke	4%	7	Elapsed time	27.16	40.54	
					Lap time	13.41	13.35	13.34
2	Marmon	Bob Burman	4%	7	Elapsed time	28.17	42.05	
					Lap time	14.17	14.00	13.48
14	Fiat	D. Bruce-Brown	5	7½	Elapsed time	28.49	42.50	
					Lap time	14.34	14.15	14.01
15	Fiat	Joe Matson	5	7½	Elapsed time	29.07	43.11	
					Lap time	13.55	15.12	14.04
6	Mercer	Hughie Hughes	4.36	5	Elapsed time	43.05	61.51	
					Lap time	14.32	28.33	18.46
5	Jackson	Harry Cobe	5	5½	Lap time	16.29		



GRANT IN HIS LOZIER



LOUIS DISBROW IN CASE

THE duel from start to finish between Ralph Mulford and Ralph dePalma in the Vanderbilt was one that will long live in the minds of those who watched the changing conditions. In a word, dePalma took the lead in the race for the first four laps and then Mulford took it for the remaining thirteen. DePalma led Mulford by 1:10 at the end of the fourth lap, which was changed to a Lozier by 53 seconds at the end of lap five, dePalma having to change tires on the course and stop at the grandstand pits for 2 minutes while tires were put in the rack and oil and water taken on, the result being the Mulford had a lead of 2:06 at the end of lap six. He increased it to 2:14 in lap 7 and at the end of lap 8, with the race practically half over, Lozier had a lead of 5:19 and lap 9 saw the Lozier's lead increased to 5:29. This was the greatest margin that separated the two at any point in the contest.

Battle of Gladiators

DePalma cut 4 seconds off of Mulford in lap 10 and lap 11 saw 2 more seconds cut off. It was a gallant chase that dePalma was putting up and an equally gallant race that Mulford was giving him. Three more seconds were cut off in lap 12 so that at the end of this circuit Mulford had a lead of 5:20. It was at the end of this lap that Mulford slowed down to change a left rear tire and take on gasoline and oil, losing all told 1:06. He lost more because the Savannah people were anxious to have him cross the tape so that his time for the distance might be taken. At this point he had covered 205 miles and the crowds wanted to know if he had beaten the speed at the recent Santa Monica race which was at a distance of 202 miles. Mulford stopped at his pit before crossing the tape, then crossed the tape so his time was taken and then backed up to the pit. It was dangerous work with so hot a pursuer. The result was that at the end of lap 13 he had a lead of but 3:47 on the Mercedes, which was being pushed hard, dePalma doing the lap in 13:27, which proved to be his third fastest in the race.

At the end of lap 14 the lead of 3:47 was cut to 3:38. Excitement was intense

TABLE SHOWING RESULTS IN THE SAVANNAH CHALLENGE CUP

No.	Car	Driver	Bore	Stroke	1	2
22	Mercer	H. Hughes	4 3/4	5	Elapsed time.....	17.14 34.
					Lap time.....	15.18 30.
21	Marmon	B. Keene	4 23-64	5	Elapsed time.....	15.57 31.
					Lap time.....	16.21 15.
25	Marmon	J. Nikrent	4 23-64	5	Elapsed time.....	15.22 31.
					Lap time.....	15.22 14.
24	Mercer	W. F. Barnes, Jr.	4 3/4	5	Elapsed time.....	19.53 39.
					Lap time.....	15.19 15.
23	Case	Buckley	4 3/4	5	Elapsed time.....	14.56 29.
					Lap time.....	14.56 14.
27	Mercer	B. Knipper	4 3/4	5	Elapsed time.....	
					Lap time.....	
26	Case	Disbrow	4 3/4	5	Elapsed time.....	
					Lap time.....	

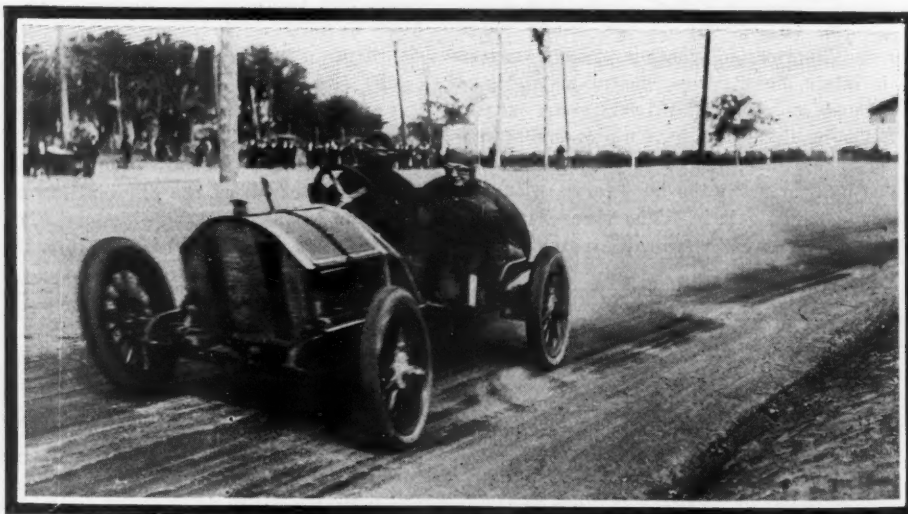
Vanderbilt a Mulford-De Palma Duel

Lozier and Mercedes -Put Up Terrific Battle for the Old Trophy—Foreign Car Leads in Early Stages But Once in Lead American Holds First Place With Bulldog Tenacity

at the end of lap 15 when Mulford had to stop to put a tire on the rack, which cost him 10 seconds. Taking on a tire meant that he had made a change on the course and when the time was announced for this lap he had a lead of but 2:33 with two laps yet between him and victory. In spite of changing a tire on the course and stopping at the pit he made the lap in 14:43. Laps sixteen and seventeen were anguishing processions. Everybody wondered—wondered if the Lozier would have

to change another tire and if so, the Mercedes would almost overtake it. At the end of lap sixteen there was 2:07 between the speed monsters at which time both were given the green flag by the starter, meaning one more lap to go.

Throughout the entire last lap the grandstand sat or stood spellbound. Nobody noticed the other passing cars, but all ears were strained to hear the megaphone announcements. As these told of the progress of the two contenders the uncertainty



HUGHES IN MERCER, TRAINING FOR THE RACES

OFFICIAL RESULTS IN RACE FOR TIEDMAN

No.	Car	Driver	Bore	Stroke	1	2
35	E-M-F	Frank Witt	4	4 1/2	Elapsed time.....	18.03 35.
					Lap time.....	17. 17.
34	E-M-F	Robert Evans	4	4 1/2	Elapsed time.....	18.41 36.
					Lap time.....	18. 18.
33	E-M-F	Jack Tower	4	4 1/2	Elapsed time.....	19.23 37.
					Lap time.....	18. 18.
36	Ford	Frank Kulick			Elapsed time.....	20.13 37.
					Lap time.....	16.23 18.
31	Abbott-Detroit	M. Roberts	4 1/4	4 1/4	Elapsed time.....	16.23 32.
					Lap time.....	16. 16.
32	Abbott-Detroit	H. L. Hartman	4 1/4	4 1/4	Elapsed time.....	18.04 32.
					Lap time.....	18.04 16.

RACE WHICH WAS WON BY HUGH HUGHES IN A MERCER

	3	4	5	6	7	8	9	10	11	12	13	M. P. H.
28	51.42	68.56	85.70	102.84	119.98	137.12	154.26	171.40	188.54	205.68	222.82	
19	45.23	60.16	75.07	89.54	104.43	119.36	135.11	150.22	165.20	180.23	195.37:22	68.34
01	15.04	18.53	14.51	14.47	14.49	14.53	15.35	15.11	18.58	15.03	15.14	
29	46.41	61.54	77.06	92.21	107.35	122.49	138.07	153.29	170.41	186.19	201.41:49	
32	15.12	15.13	15.12	15.15	15.14	15.14	15.18	15.22	17.12	15.38	15.22	66.28
58	47.33	63.10	78.42	94.08	109.37	124.07	140.50	156.38	172.27	188.35	204.42:93	
37	15.35	15.37	15.32	15.26	15.29	15.30	15.43	15.48	15.49	16.08	16.07	65.30
17	45.07	60.24	75.45	93.56	109.56	124.07	139.31	155.02	170.35	186.13		
55	14.50	15.17	15.21	18.11	16.00	14.11	15.24	15.31	15.33			
42	58.38	77.23	96.02	130.03	148.53	167.51	188.26	207.45:55				
49	18.56	18.45	18.39	34.01	18.50	18.58	20.35	19.19				
28	45.41	60.49	75.58	91.01	106.07	133.44						
09	15.13	15.08	15.09	15.03	15.06	27.37						
38	44.16	59.23										
42	14.48	14.53										



KNIPPER IN MERCER

Running of the Great American Classic

Lap by Lap Story of the Fight for the Vanderbilt at Savannah—How Mulford in Lozier Showed Way Home to Pick of Foreign Flock, Making a Sensational Average for Race

continued. Finally the Lozier was announced as being in the home stretch; a few seconds later he was in the grandstand turn for the last time and then the checkered flag ended his part of the drama amid deafening cheers. As the Mercedes carried No. 10 and Lozier No. 8, the Lozier had a minute lead and so everybody knew that to win dePalma had to get his Mercedes across the tape inside of that minute. Seconds chased one another, finally but a few remained and no dePalma. At

last he came, tearing down the stretch as he had done in the second lap when he made the record for the course. The crowd knew he was defeated but had learned to love his sportsmanship. They jumped to their feet and greeted him as they had greeted Mulford a couple of minutes before. When the official times were announced it was seen that the Lozier had a margin of 2:11.28, it having gained 4 seconds on the Mercedes in the last circuit.

In analyzing the performances of the

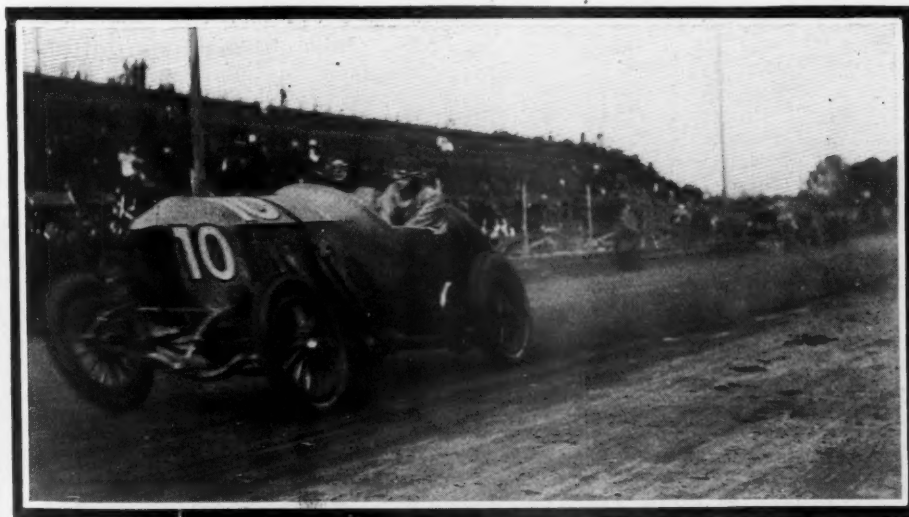
two cars on the seventeen circuits the Mercedes made fourteen of the seventeen circuits under the 14-minute mark, which means over 73.5 miles per hour. The record of 13:14 is 78 miles per hour. The following were his laps: 13:14, 13:16, 13:27, 13:32, 13:33, 13:33, 13:36, 13:38, 13:38, 13:42, 13:43, 13:45, 13:46, and 13:50. He had three slow laps namely 5, 6 and 7 in 15:39, 15:12 and 17:07 seconds.

As compared with this the winning Lozier made thirteen laps under the 14-minute mark, the fastest one being the seventh in 13:25. Mulford showed remarkable regularity by doing four laps in 13:41 each and three in 13:45 each and two in 13:38 each. His slow laps due to tires and fuel were 8, 13, 16 and 15.

Lap by Lap Story

Lap 1—It was a whirlwind start, six of the fourteen starters setting out to do the distance under the 14-minute mark and they did it. Ralph dePalma, the favorite before the start, set the pace with a lap in 13:33 or 76.5 miles per hour and Patschke in the Marmon was close by in 13:41 with Wishart in another Mercedes, the Mulford Lozier and the Matson Fiat close behind. It was a magnificent opening spectacle.

Everybody wondered what the course would be and when the opening lap was so favorable everyone looked for the establishing of new road race marks. Starter Wagner got them away at 30-second intervals and it was a long 7-minute wait from the time Matson left the tape until the megaphone announced "car coming." Down the stretch a white meteor flashed towards the big grandstand turn and Grant in No. 1 Lozier, first away, was first to cross the tape. Behind him came Burman in his yellow Marmon, a literal streak as it flew down the black polished roadway. Scarcely had Burman passed the judges' stand than the somber gray Wishart Mercedes took the curve in arrow-like fashion and was gone. Disbrow in the Pope-Hummer was not 200 yards back of him. Then came a wait, seconds seemed minutes and minutes, hours. Eyes were strained into the bushes on the stretch where the black ribbon of road emerged from the foliage.



DE PALMA IN MERCEDES IN HOMESTRETCH SPRINT

CUP, WHICH WAS WON BY WITT IN AN E-M-F

	2	3	4	5	6	7	8	9	10	M. P. H.
1	35.46	54.02	71.46	89.15	106.45	124.07	141.24	158.48	179.19:34	57.35
18.03	17.43	18.16	17.44	17.29	17.30	17.22	17.17	17.20	17.35	
18.41	36.53	54.48	72.33	90.16	108.01	125.46	144.37	162.25	180.12:34	57.06
19.23	18.12	17.53	17.45	17.43	17.45	17.45	18.51	17.48	17.47	
20.13	37.45	56.01	74.19	92.33	110.23	128.16	146.03	163.46	181.33:84	56.64
16.23	18.22	18.16	18.18	18.14	17.50	17.53	17.47	17.43	17.47	
18.04	37.10	58.47	83.18	100.54	119.55	139.25	157.31	180.36	201.07:50	51.13
	18.57	19.07	25.01	17.36	19.01	19.30	18.06	23.05		
	32.45	49.17	65.49	82.29	99.16					
	16.24	16.30	16.32	16.40	16.47					



MAGNIFICENT STRETCH ON WATERS ROAD AT SAVANNAH

A wait and then a yellow flash and Patschke in his Marmon came and went. Another glance saw Mulford in his white Lozier and with white uniform chase Disbrow. These five were ahead of the rest of the field. Then followed a wait. Every one was anxious. Presently the gray No. 10 Mercedes of dePalma shot into the curve and was gone. Behind him came No. 9 Jackson, the only time the grandstand was to get a sight of it. It withdrew in the second lap.

Everybody looked for some of the red Fiats; they all started late, their numbers being 11, 14 and 15. Parker in No. 11 came first. A blue Abbott was next. No. 9, driven by Mitchell, and then came 15 and 14 Fiats, Matson, driving 15, having passed his team mate on the opening lap. With all passed the grandstand the crowd settled down to witness the score boards and see how the struggle progressed.

Lap 2—This was a Mercedes lap, with dePalma first, Wishart third and Patschke's Marmon sandwiched between. Mulford was running in fourth place. This was a bad lap for Grant who lost a tire and dropped to tenth place. DePalma did the circuit in 13:14, which proved to be the fastest circuit of the race, a pace of 77.6 miles per hour. Mulford put himself in fourth place in the opening lap and held it. Parker's No. 11 Fiat was but 26 seconds back of him. These five, Mercedes, Marmon, Mercedes, Lozier and Fiat, already were in a bunch by themselves in the lead. Back of them came another group made up of Burman in a Marmon, Brown in a Fiat and Hughes in a Mercer, Grant in Lozier already was having tire troubles and was 5½ minutes behind dePalma. Back of him came the Abbotts. At this time there was 16 minutes between the first and last cars, with one car out, No. 5 Jackson.

Lap 3—This lap saw the first big shuffling up and changing of positions among the speed kings. The first four leaders re-

mained unchanged, namely, Mercedes, Marmon, Mercedes and Lozier, but here it ended. Burman pushed No. 2 Marmon to the front and took second place and Parker's Fiat, which dropped from fifth to ninth. No. 15, Matson's Fiat, stopped to take on water due to a leaky connection and so dropped to seventh place. Disbrow established himself in eighth position with Parker and Grant below him. The two Abbotts were next, with Hughes in a Mercer last. No cars dropped out in this lap but the Mercer had troubles that brought about its withdrawal in the next circuit.

Lap 4—The cars were stringing out in this lap. It was a foreign lap with the Mercedes first and second, dePalma in the lead and Wishart second, having nosed Patschke's Marmon out, which dropped to sixth position. Mulford had gained third place and was only 1 second behind Wishart, the figures being: Wishart, 54:55; Mulford, 54:56. But dePalma had the other Mercedes 1 minute 11 seconds in the lead. The cars were roughly in three groups, Disbrow, Grant and Matson in the second with the two Abbotts in the third.

Lap 5—This lap was epoch-making as it saw the dislodgement of the European representatives, and the American car forged to front, Mulford's Lozier taking dePalma's place as leader, which he held to the end. But it was still worse for the Mercedes people as Wishart stopped for a tire change and lost 2 minutes, the new rim not fitting. This put him from second to fifth place and moved up Burman and Brown. Below this the order of affairs remained the same excepting that No. 15 Fiatt dropped out because of a broken radiator trunnion. There were three cars out with but five laps covered. At this time Grant and Disbrow were having a pretty duel. They passed the grandstand not a length apart on the fourth lap.

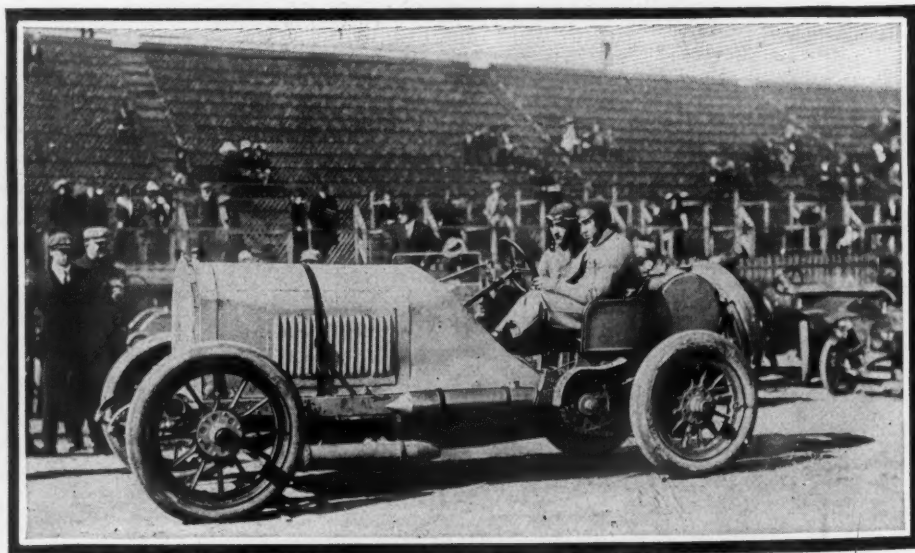
Lap 6—Changes came in this lap. Mulford's Lozier held first place but dePalma dropped from second position to third,

THEIR FASTEST LAPS

VANDERBILT CUP				
No.	Car	Lap	Time	M.P.H.
8	Lozier	7	13.25	76.6
10	Mercedes	2	13.14	77.6
4	Mercedes	3	13.35	75.6
1	Lozier	15	13.59	73.5
11	Fiat	1	13.57	73.6
3	Pope	5 & 9	14.14	72.1
9	Abbott	10	15.08	67.8
7	Abbott	3	17.27	58.9
12	Marmon	7	13.23	76.7
2	Marmon	3 & 6	13.48	74.4
14	Fiat	4	13.59	73.5
15	Fiat	1	13.55	73.8
6	Mercer	1	14.32	70.7
5	Jackson	1	16.29	62.4

SAVANNAH CUP			
22	Mercer	6	14.47 69.6
21	Marmon	3 & 5	15.12 67.6
25	Marmon	6	15.26 66.5
24	Mercer	8	14.11 72.4
23	Case	5	18.39 55.0
27	Mercer	6	15.03 68.2
26	Case	2	14.42 69.8

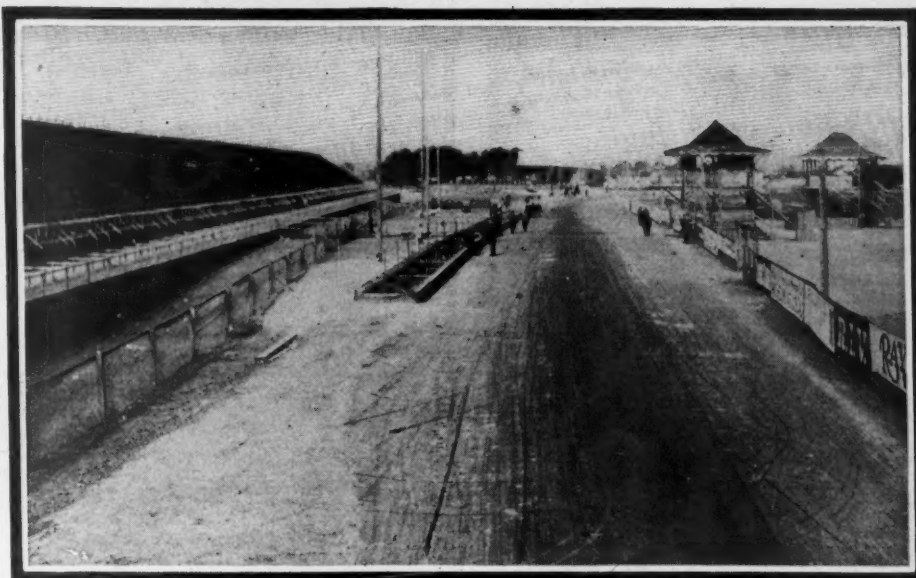
TIEDEMAN CUP			
35	E-M-F	8	17.17 59.5
34	E-M-F	5	17.43 57.8
33	E-M-F	9	17.43 57.8
36	Ford	5	17.36 58.3
31	Abbott	1	16.23 62.7
32	Abbott	1	18.04 56.8



ERWIN BERGDOLL IN HIS GRAND PRIX BENZ

Burman by fast driving having supplanted him with a margin of almost 1 minute, while Mulford had in turn a lead of 1 minute on him. In fact, each of the four leaders, Mulford, Burman, dePalma and Brown, were 1 minute apart. Wishart was fifth and 3 minutes behind the first group. Grant and Disbrow were still together, the latter leading by 46 seconds. They were both 8 minutes back of the leaders. One Abbott was 7 minutes back of them and the other 27 minutes back. As Bruce-Brown passed in his Fiat it was known that the rear axle was badly sprung, the wheel toeing out. The referee had issued instructions to stop him on the following lap, but this was unnecessary for soon a megaphone announcement told of his losing the left rear wheel on a turn, and he was out in the following lap.

Lap 7—This was not an eventful lap. Bruce-Brown in the Fiat dropped out when in fourth place and so moved those below



VIEW OF SAVANNAH HOMESTRETCH BEFORE THE RACES

LAP POSITIONS OF ALL CARS IN THE THREE RACES

VANDERBILT																
No.	Car	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8	Lozier	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10	Mercedes	1	1	1	1	7	8	3	7	3	1	1	1	1	1	1
4	Mercedes	3	3	2	5	9	3	5	1	2	3	8	3	2	2	2
1	Lozier	7	11	11	6	4	4	6	3	4	4	3	4	3	6	3
11	Fiat	6	6	8	7	6	7	8	5	6	6	5	5	4	4	5
3	Pope-Hummer	9	8	7	11	5	5	7	4	5	5	4	6	7	7	4
9	Abbott-Detroit	12	10	9	8	8	9	9	6	7	7	6	8	6	7	7
7	Abbott-Detroit	13	12	10	10	10	11	10	8	8	8	7	8	8	8	8
12	Marmon	2	2	3	9	1	10	1	9							
2	Marmon	8	5	4	3	3	1	4								
14	Fiat	10	7	5	4	5	6									
15	Fiat	5	9	6	12											
6	Mercer	9	13	12												
5	Jackson	11														

SAVANNAH												
No.	Car	1	2	3	4	5	6	7	8	9	10	11
22	Mercer	2	3	3	7	1	1	1	2	3	1	4
21	Marmon	5	5	4	3	3	3	3	1	2	3	2
25	Marmon	6	6	6	5	5	4	4	4	4	2	3
24	Mercer	4	2	2	4	4	5	5	1	2	3	1
23	Case	7	7	7	6	6	6	6	5	5	5	4
27	Mercer	3	4	5	2	2	2	2	6			
26	Case	1	1	1	1							

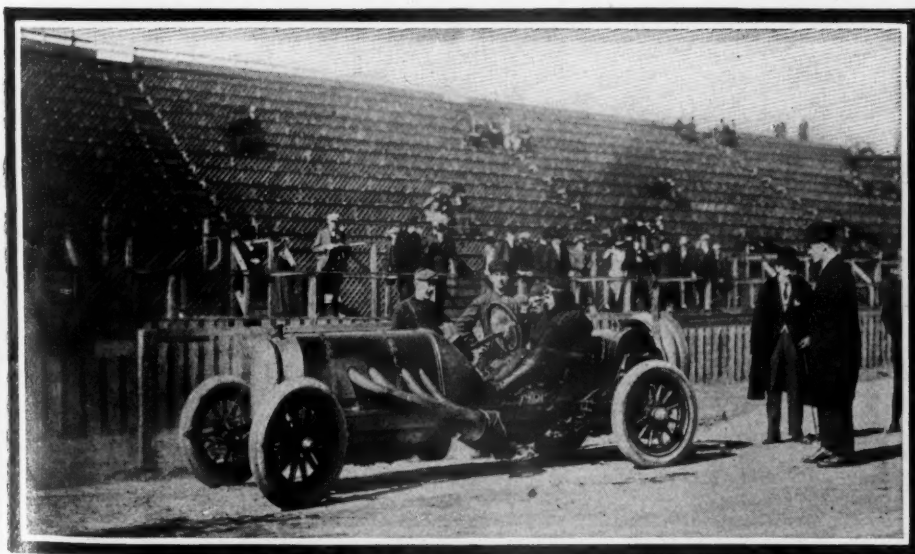
TIEDEMAN										
No.	Car	1	2	3	4	5	6	7	8	9
35	E-M-F	2	2	3	4	2	2	2	1	1
34	E-M-F	4	3	2	3	4	3	2	4	3
33	E-M-F	5	4	3	4	5	4	3	2	2
36	Ford	6	5	4	5	3	5	4	3	4
31	Abbott-Detroit	1	1	1	1	1	1			
32	Abbott-Detroit	3								

him up, putting Wishart's Mercedes fourth, Patschke's Marmon fifth and Parker's Fiat sixth. Disbrow was seventh, Grant eighth and Abbotts ninth and last.

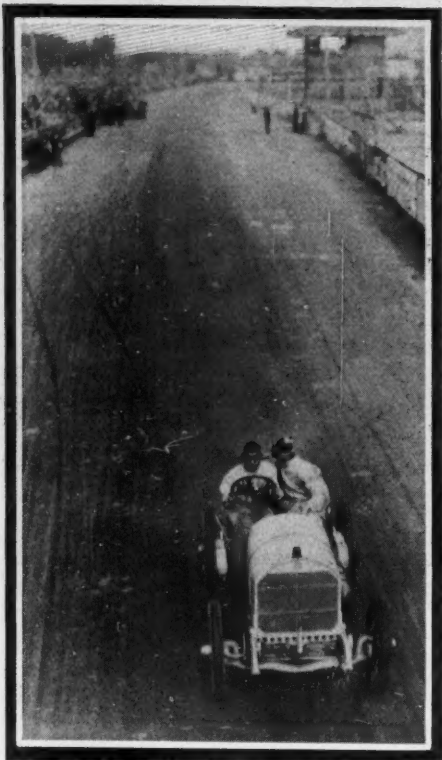
Lap 8—This lap was disastrous to the American field in that Burman's Marmon, which he had put in second place and only 1 minute 7 seconds back of Mulford, went out because of magneto trouble. Wishart put his Mercedes from fourth into second place with dePalma in third, Parker fourth, Disbrow fifth and Grant sixth. Patschke dropped from fifth to eighth and went out in the following lap, the report being engine troubles. The contest was now resolving itself into a Lozier-Mercedes duel just as the Savannah race a few hours before became a Mercer-Marmon duel. Grant was well up in his climb from tenth place, being now in sixth and as after events showed continued this upward march until in third position.

Lap 9—This lap brought more American disaster, though not unexpected as Patschke, who had been long looked for, was declared out, leaving Mulford and Grant to uphold the American end of the race against the two Mercedes and Grant's Fiat. By this time the cars had all settled down to a definite performance. The race was half over and there was little change in the order, which was Mulford, Wishart, dePalma, Disbrow, Grant, Parker and the two Abbotts. Disbrow and Grant had passed up, lowering Parker from fourth to sixth place. Six of the fourteen cars that started were out. There was 50 minutes between the leading Lozier and No. 7 Abbott. Both of the Abbotts were much lower powered than the other cars, but they showed remarkable regularity, No. 9 doing particularly reliable work.

Lap 10—There was only one change in this lap, this being Grant's Lozier climbing into fourth and pushing the Disbrow Pope into fifth position. This was the end of a duel between these two cars that had



LOUIS DISBROW IN POPE IN THE VANDERBILT



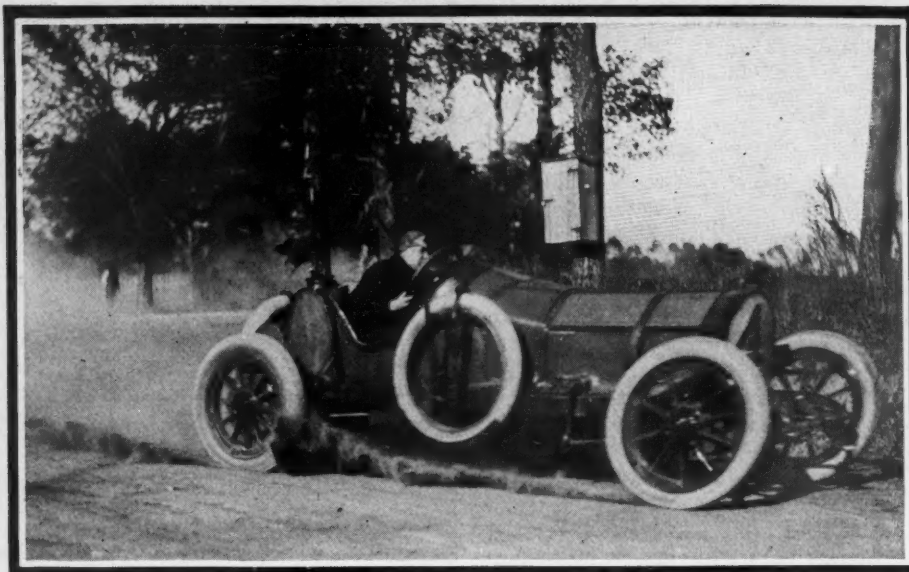
HEMERY IN GRAND PRIX BENZ

continued practically from the fourth lap. At this point Grant was gradually pulling away, his lead being 11 seconds. At this part of the race Mulford was leading the two Mercedes by 4 and 5 minutes and Grant was 5 minutes back of them. Parker's Fiat was 2 minutes behind Grant.

Lap 11—This lap saw Wishart's Mercedes drop from second to sixth place, putting dePalma in second, Grant third, Disbrow fourth and Parker fifth. Disbrow had his troubles on the back stretch and he was 22:45 on the circuit, one of the longest of any of the leaders that finished. DePalma made the lap in 13:42 and Mulford in 13:45, both running very closely together. No. 9 Abbott was maintaining its place by going the circuit in 15:08, a pace of 68 miles per hour.

Laps 12 and 13—Not a single change in the position of the contestants occurred in these laps. In lap twelve Mulford stopped 1 minute 6 seconds to change a left rear shoe and take on gasoline and oil. Disbrow stopped to change a left rear, losing 1 minute 35 seconds. Wishart was traveling fast in these laps and was rapidly cutting down the lead that Grant in third place had on him. DePalma also was traveling very fast and, due to Mulford having to stop, had cut his 5-minute lead to about 2 minutes. This marked part of the grand struggle on the part of both dePalma and Wishart to dislodge the leading Lozier. The Lozier had 5 minutes on dePalma, 13 minutes on Wishart, 14 minutes on Parker's Fiat and 13 on Disbrow.

The finish—Laps fourteen, fifteen, sixteen and seventeen can properly be considered together because in lap fourteen Wishart climbed out of third place and from



CYRUS PATSCHKE IN HIS GRAND PRIX MARMON

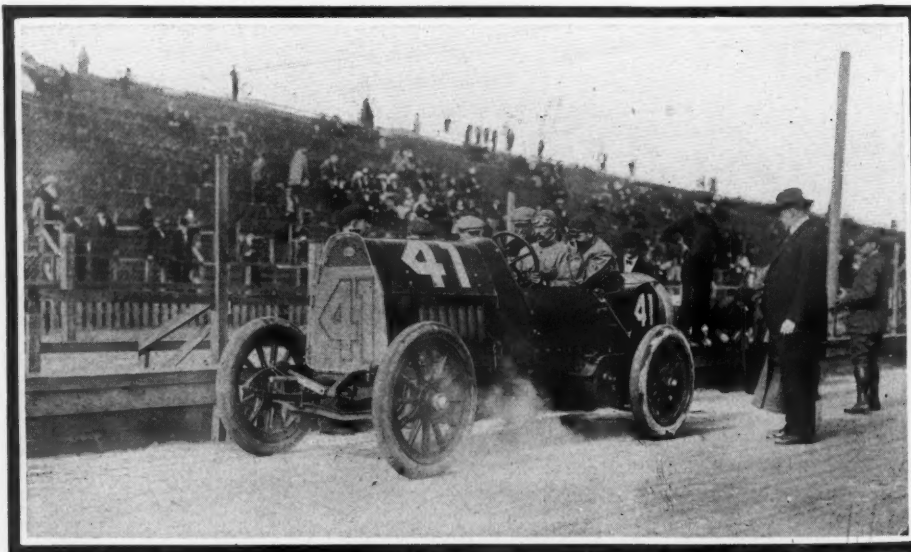
Running of Savannah Cup

that to the end there was not a change in the positions of the eight cars that were running. This order was Mulford, dePalma, Wishart, Grant, Parker, Disbrow and Mitchell and Limberg in Abbotts. As told in another place, the fight for first place was between dePalma and Mulford in these four laps. Mulford had to stop to change a tire on the back stretch and also to take a new casing on at the pits, this cutting his lead of 5 minutes to 2. But with only a couple of laps to go the handicap was too much for the Mercedes. Wishart was firm in third and Grant safe in fourth, having 4 minutes lead on Parker, who was fifth. Six cars finished the entire seventeen laps and the two Abbotts were running at the finish. No. 9 finished sixteen laps and No. 7 finished 14. Six cars dropped out of the race for one reason or another.

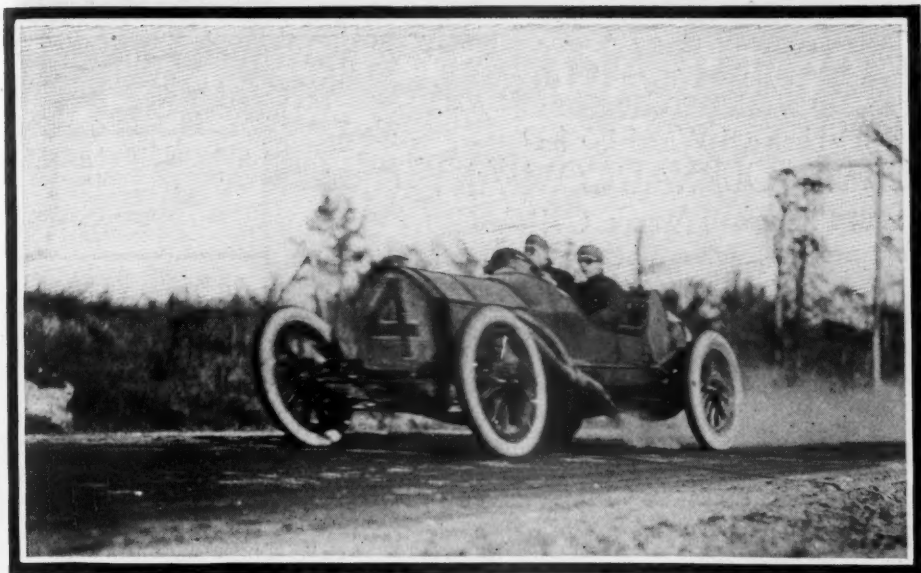
THE race for the Savannah trophy was started this morning at 8 o'clock and was for a distance of 222.82 miles or thirteen laps of the circuit. Seven cars started, three Mercers, two Marmons and two Case specials. Hughie Hughes, driving No. 22 Mercer, won, going the 222.82 miles in 195 minutes and 37 seconds or 68.34 miles per hour. Heinemann, driving a Marmon, was second, being 4 minutes behind the Mercer. Third place was won by Nikrent in another Marmon.

This race was a Mercer-Marmon duel from the fifth lap to the end. Up to the fifth lap Disbrow, driving the Case Special, led with Mercer's second and Marmon's third. Disbrow withdrew in the fifth lap, owing to motor troubles and this put the Hughes Mercer into the lead, which position it maintained until the end.

The Mercer-Marmon duel was an inter-



LOUIS WAGNER IN GRAND PRIX FIAT



DAWSON, OF MARMON TEAM, BEFORE HIS ACCIDENT

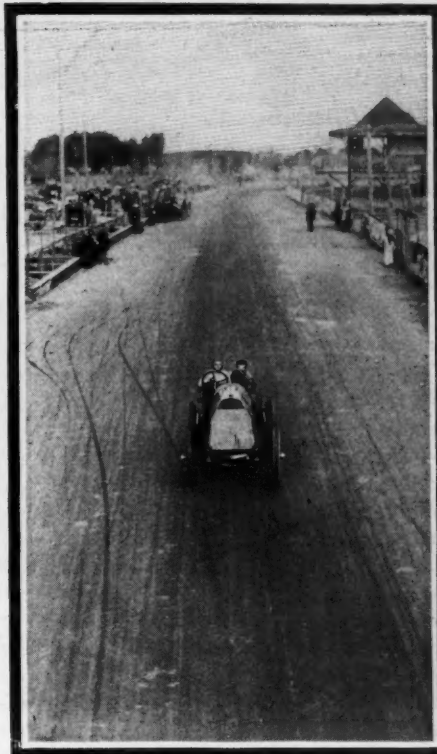
E-M-F's Tiedeman Victory

esting one from start to finish. It was not a case of one Marmon contesting against one Mercer, but the three Mercers were waging war against the two Marmons with varying success, although Hughes never was headed.

This race was started at 8 o'clock this morning with the ground white with frost, which made it cold during the first few laps. Disbrow started out to burn up the course and without doubt would have been an easy winner had his car held up. He made his first lap 22 seconds faster than his nearest competitor; at the end of lap two he had a 49 second lead on Barnes in a Mercer; in the third lap his lead was 51 seconds and in the fourth it was 54 over Hughes running second. Once the Case was out, the race was taken in hand by Hughes, who led from the fifth lap to the finish. While the Case was lead-

ing, the Mercer was running second and third with the Marmon fourth and in lap five it was Mercer one, two and three, the drivers being Hughes, Barnes and Knipper.

Lap six saw Knipper move to second place and Heinemann in No. 21 Marmon annex third position. Lap seven saw more Marmon gains in that Nikrent, driving Marmon No. 25, passed Barnes in the Mercer. In lap eight it was Mercer, Marmon, Mercer, Marmon, Mercer. Lap nine saw the same order of running continue and Knipper's Mercer was taken out, the trouble not being known. In lap ten the order remained unchanged. Lap eleven saw the Barnes Mercer take second place away from Heinemann's Marmon, which it held in lap twelve but lost in lap thirteen, the last of the race, so that when it was over the order was Mercer, Marmon, Marmon, the Barnes Mercer not finishing.



BRUCE-BROWN IN GRAND PRIX FIAT

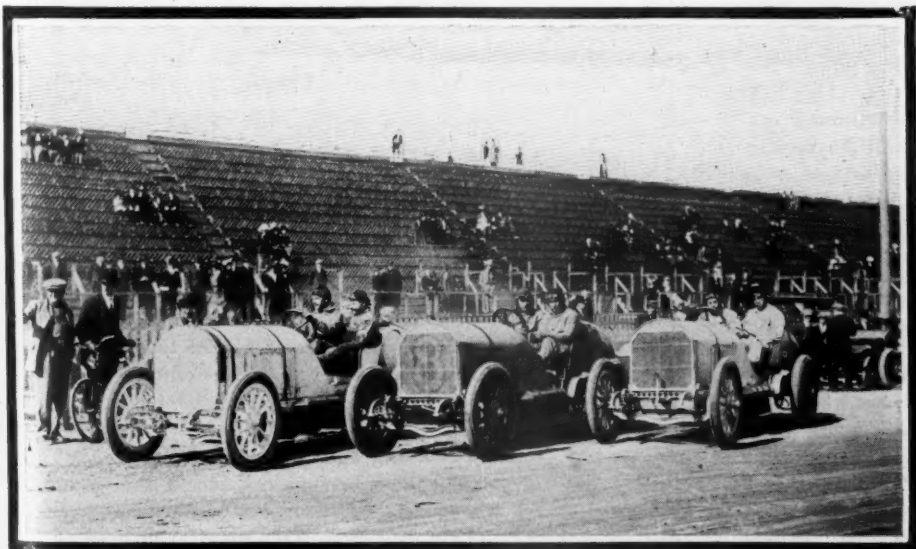
TODAY'S race for the Tiedeman trophy, ten laps, 171.40 miles, was won by E-M-F machines that finished one, two and three, the only other car running at the finish being Kulick in the Ford. Two Abbott-Detroits were entered but one went out on the second lap and the other in the seventh. There were six starters and the race was started immediately after the Savannah, the first car in the Tiedeman starting 30 seconds after the last of the Savannah. The three E-M-F cars made a remarkable showing, all finishing within a 3-minute zone.

The winner, No. 35, was driven by Frank Witt, made the 171.40 miles in 179 minutes 19 seconds; No. 34, driven by Robert Evans, was second in 180 minutes 12 seconds, and No. 33 third in 181 minutes 33 seconds. Kulick in the Ford covered the distance in 201 minutes 7 seconds.

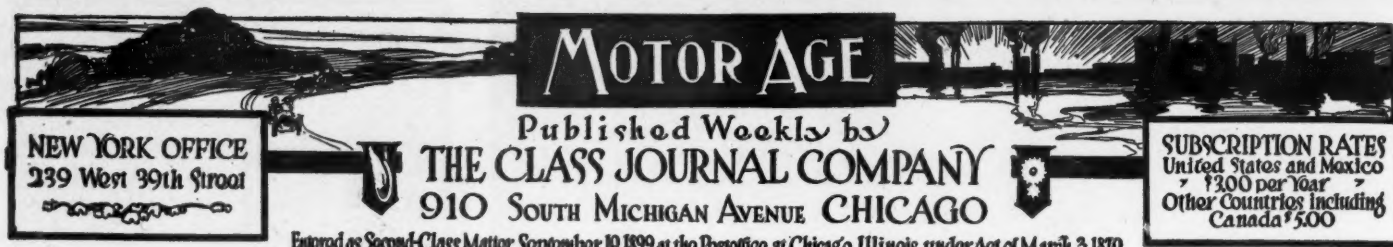
The fastest lap in the race was made by Mortimer Roberts in No. 31 Abbott being 16:23 or 63 miles per hour. When Roberts dropped out in the seventh lap he was 7 minutes in the lead, with the three E-M-Fs in second, third and fourth places.

Hartman in No. 32 Abbott was put out early in the battle, being eliminated in the second lap when a valve rocker broke. His partner, Roberts, winner of the Aurora cup, was a factor as long as he was running, but a cracked cylinder put an end to his aspirations at a time when it looked as if he would cash.

When it came to a race among the three E-M-F machines, No. 35 took the lead and maintained it, the other two not changing places. They all ran very consistently as an analysis of their lap times will show.



BENZ TEAM—HEMERY, BERGDOLL AND HEARNE



NEW YORK OFFICE
 239 West 39th Street

MOTOR AGE

Published Weekly by
THE CLASS JOURNAL COMPANY
 910 SOUTH MICHIGAN AVENUE CHICAGO

SUBSCRIPTION RATES
 United States and Mexico
 \$3.00 per Year
 Other Countries including
 Canada \$5.00

Entered as Second-Class Matter September 12, 1892, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

Racing Preparations

AS one of the old war generals remarked that a campaign or certain battle was often won before the actual fighting began, so with a big road race, it is often won before the day of the race. Preparations of car and driver are the big factors in all forms of contests, and it is in this respect that the good judgment of many team managers appears. In the preparation for this week's Vanderbilt cup race, which was what is known as a class C event, or non-stock race, the entrants were given much latitude in the preparation and perfecting of the cars, to do little things that were not permitted in a stock chassis race. The drivers, who had tried their cars out for a week or so, had got the carbureter adjustments perfected and many of them had actually soldered all of the adjustments so that it would be impossible for any helper or workman around the camp to interfere with the adjustment of them. Such precautions as these should be a good guard against troubles that have happened in times past, in which it was said that the cars had been tampered with by some parties who were perhaps enemies in disguise, and had been coached by other camps to do some little thing to upset the chances of their rivals. With the soldering precautions all such possibilities are eliminated.

ANOTHER commendable precaution to take is that of safeguarding certain parts of the car that might break and cause accidents. One of these is tying up the forward ends of the radius rods extending from the rear axle housing to the side members of the frame. In several races the attachment of these at the forward end has given way, allowing the rod to drop to the ground, the front end digging into the road and perhaps causing a fatal accident. A short leather strap around the rod and passing over the frame obviates such dangers. In one or two touring cars, which have been developed in the racing business, such precautions as metal straps for this work are furnished as regular equipment.

NEARLY every car entrant in a non-stock event does not take any chances in the matter of ignition terminals working loose. It is customary to tape these where they connect with the spark plugs and also to support the cables at many points between the magneto and the plugs in order to take as much strain as possible off of them. Hand in hand with the abundant taping of ignition cables is that of taping all of the water connection pipes where they unite with the waterjackets or with the radiator. This is to avoid water leaks due to excessive vibration. Leaking water connections, while apparently very simple troubles, are often very serious ones. The little leak may give rise to heating of the motor which may be attributed to faulty carburation, lack of enough lubricant or a score of other troubles, and the driver may upset the generally well balanced condition of the motor parts by this searching for the trouble. The taping is a very easy solution.

IN the early days of racing the leaky gasoline line was a common source of trouble. Many racing teams used cars which as pleasure cars had the gasoline tank under the front seat, but when built into racing cars placed the tank over the rear axle, thus necessitating a long gasoline line and also placing the tank where it was subject to greater vibration. This rear positioning of the tank not only called for heavier piping from the tank to the carbureter but also for a better supporting of the pipe. This has been attended to in the last few years. Today the feed pipes are heavier and they are often carried in a rubber tubing.

THERE is one respect in which present practice in road racing does not seem to be operating along a permanent improvement line and that is in the matter of springs. The springs are now generally wrapped from end to end but in addition two sets of shock absorbers are fitted; that is eight shock absorbers are fitted to the car. This can scarcely be looked upon as an improvement in the car suspension line. Many car makers fit shock absorbers as stock, but it will be a long time before the fitting of a double set will become stock. It would seem that some improvements should be made in the springs. It may be a little unfair to look for spring improvements in touring cars when they are expected to carry their loads at 50 to 60 miles per hour and the light racing cars are expected to make speeds of over 100 miles per hour. There are several of the foreign machines on which very short springs are used, springs specially intended for very high speeds, and with these only one set of shock absorbers is used.

Vanderbilt Cup Lessons

MUCH of importance in the future of racing was impressed on not a few of the contenders in the Vanderbilt race, run on Monday of this week. The Vanderbilt was a free-for-all race for cars of under 600 cubic inches piston displacement. Because of this many new creations were entered, cars that never have been stock and in many cases the makers never intended that they would be stock. They are machines built solely for advertising purposes, machines specially designed for speed and to spread the name of the makers from one side of continent to the other as well as to herald them through several continents. As happened in the Vanderbilt race of last year, and as happened in a great many other races, these special creations were not winners and these cars that really showed up best were fairly close to stock products.

THE makers are coming more and more to the realization of the fact that endurance is a great factor in road racing and that the stock car is best and most reliable when it comes to endurance. Stock cars should be. If a maker, after having spent years in perfecting and getting all of the kinks out of certain models, has not a reliable car, then he is not building for the future but to get as much money as he can in the present. Building special racing machines is very expensive because of what these machines cost, but it is also expensive in that the proportion of winnings in such machines is very slight. The victory of a stock car is more valuable to a maker than a victory of a free-for-all non-stock machine. The public takes more interest in a car that it can buy and in a car that many of that public actually own than in a car that they themselves know they cannot buy, and if they could buy them they would not be of any use to them.

IN the three races—the Vanderbilt, the Savannah and the Tiedeman—there was not a single freak or special type of car that won. All of the winners were close to the stock liners and where they varied from stock the changes were in some few safety factors and make of equipment and not in the features of car design. A few promoters are working against the stock car idea. They think it is easy to get entries in non-stock events and they have convinced some of the makers that non-stock cars are better. Some of these makers who have weakened on the stock-car proposition are now getting back into line with it. Races are put on to sell cars and make business for the car builders and not as spectacles.

Statistics of the Tenth Olympia Show

STATISTICAL HISTORY OF OLYMPIA SHOW

	Olympia		Grand Palais	
	London	1910	1910	1908
Classification and analysis	1911	1910	1910	1908
Light and heavy cars, open.	16	33	13	41
Cars with detachable covers.	207	190	137	123
Cars with permanent covers.	147	168	200	154
Total, large cars.	370	391	350	318
Voltures, 2 and 3-seaters.	83	64	51	45
Racing cars and type.	1	...	4	18
Three-wheeler and very small cars.	6	3	5	4
Total, complete cars.	460	458	410	385
Chassis, all kinds.	125	132	146	190
Total, pleasure cars and chassis.	585	590	556	575
Omnibuses, etc.	...	...	11	...
Vans, lorries, trade carts, etc.	...	...	38	...
Gross total.	585	590	605	575
Means of propulsion—				
Gasoline only.	580	579	598	566
Gasoline and electricity.	...	...	...	...
Electricity only.	...	...	...	...
Steam.	5	9	7	...
Grand totals.	585	590	605	575
Methods of driving—				
Propeller, cardan-shaft.	569	572	533	456
Chain, double and single.	7	12	59	106
Electricity.	...	...	...	...
Friction.	6	3	7	5
Belt.	...	...	...	...
Gear wheels or direct drive.	3	...	2	...
Grand totals.	585	590	605	575
Countries of origin—				
Great Britain.	271	294	19	4
France.	174	185	508	480
Italy.	33	29	31	35
Germany.	41	29	20	19
Belgium.	20	25	9	18
America.	28	18	8	6
Switzerland.	9	7	6	11
Austria.	6	3	...	2
Holland.	3	...	...	...
Spain.	...	...	4	...
Grand totals.	585	590	605	575

LONDON, Nov. 11—Statistics in connection with the Olympia show always are interesting, but they are more so this year because of the importance of the English exhibition since there is no Paris salon. H. Hewitt Griffin, statistician for the Autocar, has just compiled his annual report, and he finds the tenth annual show to be much larger than its predecessors. There were 143 separate exhibits of cars or chassis. Out of the ninety-eight exhibitors in the main hall, eighty-three showed complete cars only, three chassis only and eighty both. In the annex there were forty-five exhibitors; thirty-three showed complete cars only; no one showed chassis only; twelve showed both. Last year there were 139 car and chassis exhibitors, according to the Autocar.

Mr. Griffin reports a very slight gross increase in comparative values, though Great Britain is nearly \$50,000 under last year, as is shown in an accompanying table. In another table he shows that this year's average for car and chassis is \$2,638.40, which is lower than some past years. There were nineteen English cars priced at over \$4,850 each, their total value being \$116,974.

"No fewer than forty-three of the two and three-seated cars were shown," says Mr. Griffin. "The chain drive almost is most extinct, there being only one pleasure car fitted with double-chain drive. Six friction-drive cars also have chains, so, strictly speaking, there were thirteen vehicles with chains, but not one of the

COMPARATIVE VALUES OF CARS EXHIBITED IN OLYMPIA SHOWS

No. of Firms	Country	1911		Total	1910	1909
		Cars	Chassis			
66	England	\$607,161.80	\$85,999.20	693,162.00	\$59,946.50	710,515.30
4	Scotland	32,398.00	6,305.00	38,703.00	24,942.05	34,032.45
70	Great Britain	639,559.80	92,305.20	731,865.00	784,938.55	744,537.75
55	France	362,372.60	72,129.20	434,501.80	464,043.15	449,396.15
19	Germany	97,586.85	6,765.75	104,352.60	74,899.70	54,344.25
12	Italy	78,987.10	23,619.50	102,606.60	71,440.50	75,305.95
10	Belgium	57,884.75	4,850.00	62,734.75	72,880.95	60,755.95
9	America	43,708.20	7,347.75	51,055.95	40,065.85	30,167.00
2	Switzerland	13,167.75	10,403.25	23,571.00	14,511.20	27,931.15
1	Austria	20,927.75	1,891.50	20,927.75	8,899.75	13,846.75
2	Holland	9,457.50	2,958.50	12,416.00	...	...
143	Total, 9 countries.	1,323,652.30	222,207.65	1,544,131.54	1,531,479.65	1,456,284.95

NUMBER AND AVERAGE VALUE OF CARS

	1910	1909	1908	1907	1906
Value	\$1,540,479.65	\$1,456,294.85	\$1,410,278.15	\$1,690,734.25	\$1,804,265.55
No. of cars	589	597	532	569	576
Average cost	\$2,599.60	\$2,439.55	\$2,648.10	\$3,021.55	\$3,125.55

regulation type. Yet in 1904 two-thirds of the cars at the show of that year had chain drive. In 1906 it was exactly one-third. Even 3 years ago more than 10.33 per cent was recorded, and in the 1908 Paris show 18.43 per cent."

ASKS FOR MAIS RECEIVER

Indianapolis, Ind., Nov. 25—Harold S. Block, Wheeling, W. Va., a stockholder, has brought suit in Marion county superior court asking receiver be appointed

for the Mais Motor Truck Co. He charges the company is insolvent and has indebtedness of \$144,000 and that the company lost the option on a building and real estate because it failed to pay \$5,000 on or before November 21. He says the company has much material on hand and that it would be to the best interests of the stockholders to have the plant operated under court control. The company has been given permission by the court to finish six trucks before the hearing of the petition for a receiver.

Will H. Brown, president of the company, says there is no occasion for a suit as the assets exceed the liabilities by \$130,000. The company has a good business. Negotiations are under way for financing the company. In accordance with present needs, Mr. Brown says the suit was brought through pique and that block is a small stockholder.

CUSTOMS REGULATIONS AMENDED

Washington, D. C., Nov. 25—The secretary of the treasury has informed collectors of customs that the following articles of the customs regulations of 1908 have been amended to read as follows:

Article 595—Motor cars, motor cycles, etc., and accessories, of foreign origin imported into this country by the owners personally for bona fide touring purposes only, provided such owners are nonresidents of the United States, are entitled to free entry under bond for a stay of 6 months; provided, however, that such owner shall present at the time of making entry a certificate from the United States consul at the port of exportation, based upon the sworn statement of the owner, to the effect that the said article is brought to this country for touring purposes only and that the same is not to be used for any commercial purposes or business pursuits whatsoever while in the United States. The articles enumerated may accompany the owner or arrive within 30 days before or after his arrival.

Article 596—Motor cars, motor cycles, motor boats, etc., brought into this country by nonresidents of the United States for the purpose of racing or taking part in other specific contests are entitled to free entry under bond for a stay of not exceeding 6 months, but cannot be admitted hereunder for display in shows or exhibitions of any kind, nor for any commercial or trade purposes whatsoever. Such purpose shall be evidenced by the oath of the owner or his agent made before the United States consul at the port of exportation and by him certified, and presented at the time of entry.

Coming Motor Events

December 30-January 6—Show of Buffalo Automobile Trade Association, Buffalo, N. Y.
January 6-13—Twelfth annual show, pleasure car division, Automobile Board of Trade, Madison Square garden, New York.
January 6-20—Madison Square Garden show, New York City, Automobile Board of Trade.
January 10-17—Annual show, Motor and Accessories Manufacturers, Madison Square garden, New York.
January 10-17—Annual show, National Association of Automobile Manufacturers, Grand Central palace, New York.
January 13-19—Milwaukee show.
January 13-27—Show of Philadelphia Automobile Trade Association.
January 15-20—Show at Toledo, O.
January 15-20—Twelfth annual show, commercial division, Automobile Board of Trade, Madison Square Garden, New York.
January 18-20—Annual meeting Society of Automobile Engineers, New York.
January 22-27—Show at Providence, R. I.
January 22-27—Show at Detroit, Mich.
January 27-February 10—Eleventh annual show under the auspices of the National Association of Automobile Manufacturers, Coliseum, Chicago.
February 1-7—Tentative dates for show at Washington, D. C.
February 5-10—Annual show, Pleasure Car Exhibit, St. Louis.
February 5-17—Show at St. Louis.
February 12-17—Annual show, Commercial Car Exhibit, St. Louis.
February 12-17—Show at Kansas City, Mo.
February 14-17—Show at Grand Rapids, Mich.
February 17-24—Pittsburgh show, Pittsburgh Auto Show Association.
February 17-24—Show at Newark, N. J.
February 17-24—Minneapolis show.
February 19-24—Show at Hartford, Conn.
February 19-24—Seventh annual show of Omaha Automobile Association, Omaha, Neb.
February 21-28—Toronto show.
February 20-28—Baltimore show.
February 26-March 2—Second annual show of Elmira Automobile Club, Elmira, N. Y.
March 2-9—Pleasure car show, Boston.
March 4-9—Show at Des Moines, Ia.
March 4-9—Show at Denver, Colo.
March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston.

Americans Inspect Many English Plants

After a Round of Entertainments Yankees Finish Visit in United Kingdom—Engineers Study Workings of Du Cros Taxicab System, Visit Brooklands Track and Meet Prominent British Manufacturers and Designers

LONDON, Nov. 17—With the rousing cry "What's the matter with Crossley?" and the equally rousing reply "They're all right," the English portion of the Society of Automobile Engineers' trip to Europe came to a close at Manchester. For 11 days the visitors from across the Atlantic had been received by British manufacturers with a degree of cordiality and an infinity of attention it is difficult to convey in words. The Englishmen were not satisfied to throw open their factories and allow the visitors to wander through; in every case the heads of the establishments and the most competent of the engineers placed themselves at the disposition of the strangers, ready to answer every question—and questions, pertinent and impertinent, were not lacking—which might be put to them. But this was not all, for instead of allowing the visiting engineers to depart satisfied and grateful for what they had seen, they were dined, wine and entertained in a royal manner. When the hour of the visit did not correspond with a meal time, light refreshments were provided; and whenever distances had to be covered between works and the railroad stations, cars were always available. There was no slobberly sentiment; indeed the visitors were often informed that they were invaders and competitors, or likely to become competitors; but everywhere there was whole-hearted cordiality and hospitality of such a nature that it will be difficult for the Society of Automobile Engineers to repay the debt when their confreres of the Institution of Automobile Engineers return the visit next year.

Visit to Wolverhampton

Wolverhampton stands out as the home of the Sunbeam Motor Car Co., one of the older cycle concerns which has turned its attention to motor car construction. Unlike some of the others, the two services have been kept quite distinct, the cycles being in one factory and the motor cars in another. The medium-priced car is produced, the output being about 1,200 annually, comprising four and six-cylinder models, with evidences of a big increase in the near future, judging from the large amount of American machine tools being put down. Although showing many evidences of French influence, the chief engineer of the factory having had French training, it was noted that on all models 5 and 7 bearing crankshafts were employed, though the Continental tendency is towards 2 and 3 bearing shafts for smaller motors. Sunbeam is one of the English firms having adopted chain-driven

By W. F. Bradley

camshaft and abandoned the worm drive to the rear axle after 1 year's experience of it. The explanation given is that the worm entails a loss of power and that the bevel, by improved methods of construction, and particularly by reason of the process of hardening, can be made equally as silent as the worm.

Inspect Renold Chain Plant

Chains were the topic of discussion at the factory of Hans Renold, Ltd., Manchester, and in view of the close attention now being paid to this method of driving camshafts, magneto and pump shafts, and in some cases the lay shaft in gearboxes, the subject was one of considerable importance. In the absence of Hans Renold, the founder of the firm, the visitors were received by his son, Charles S. Renold, who gave a brief history of the development of his concern, and of the chain industry in general, and then threw his factory open. Specializing on one article, the factory lends itself particularly to a neat layout, but quite apart from the standpoint of the motor car engineer, it has much to interest all concerned in factory management. A large amount of the machinery had been designed and built by the company for its own personal use; indeed, the only outside tools were a small number of Brown & Sharpe cutters. Of the factories visited it was the one in which automatic machinery had been developed to the highest degree, and the only one in which the use of the file was unknown.

An interesting feature was the use of silent chains for driving a very large portion of the factory machinery, belts only being used where it was necessary to have variable ratios with different sized pulleys. Bicycle chains, silent chains for the accessories of the motor car engine, heavy driving chains, chains for general transmission and wood-cutting chains formed the output, with a staff of 1,000 people on a day shift and a smaller number on a night shift. In view of the growing use of chain drive for motor car work, it is evident that the firm will have to make considerable developments at an early date; indeed, arrangements have already been made in this direction. When enough ideas had been absorbed to establish a chain factory, a move was made to the Midland hotel, where a luncheon was offered in honor of the American visitors with Charles S. Renold in the chair.

The Society of Automobile Engineers

enjoyed the distinction of being the first Americans to visit the Crossley Gas Engine and Motor Works at Manchester. The policy has always been to keep the doors closed to both natives and foreigners. Thanks, however, to the kind efforts of W. L. Letts, the gates were thrown wide open and old glory waved proudly side by side with the union jack on the arrival of the party. There are two distinct factories, one of comparatively recent origin, devoted to motor car construction, and another dating back about forty years, given over to the manufacture of stationary engines. The visitors were shown through both under the guidance of James O'Hamilton, Mr. Letts and other officials. Lack of time made the visit an unusually hurried one, although the importance and completeness of the gas engine works—the largest in England—warranted a more detailed inspection.

Practically every size of gas engine is produced, although the smaller dimensions predominate, and attention is now being paid to the construction of Diesel engines, the first of this type to be built by Crossley being on view on the occasion of the visit. The method of automatically treating big piston rings attracted much attention. The rings were cut out in the usual way, with the same thickness of metal throughout, then the inner circumference mechanically tapped with a hammer which delivered light blows near the split and increased the force as this point was departed from. As a hand operation this process is common, but it is not generally known as an automatic piece of work.

London Taxicab System

How London secures the best cab service in the world at a lower price than any other city was revealed in a visit which the members of the Society of Automobile Engineers made to the depot of W. & G. Du Cros, Ltd. London possesses between 7,000 and 8,000 motor cabs plying for hire at the uniform rate of 16 cents for the first mile and 4 cents for each additional $\frac{1}{4}$ mile. The cabs themselves possess no unusual features, for they are of various makes, the French article predominating, and have either two or four cylinders developing 8 to 15 horsepower. The secret of their successful service is to be found in the organization developed by the operating companies, and among them the one selected for inspection is probably the best.

W. & G. Du Cros operate 1,200 cabs, and always have 1,050 in use, the remainder being in the depot for overhauls and repairs. Napier has supplied 800 of



Drawn Expressly for Motor Age by John A. Bryan

AMERICAN ENGINEERS VISIT BROOKLANDS TRACK IN ENGLAND



AMERICAN ENGINEERS VISIT THE WORKS OF THE DAIMLER COMPANY

the chassis, and Panhard 400, all being four-cylinder models of practically 80 by 120 millimeter bore and stroke. The organization is such that the cabs are in service every day. There is one driver per cab, the system of double shifts having found to be unsatisfactory, and each driver must keep his cab out 12 hours per day. Payment is made on the basis of 25 per cent of the net takings, the driver buying his gasoline from the company at cost price: 18 to 20 cents per gallon, and being provided free with everything else necessary for running.

Keeping Cabs In Service

It is the company's task to so organize its depots that no cab shall be kept off the street except for the periodical overhauls. It was explained to the visitors how, after coming in at night, every cab was got ready for the road the next morning, no matter what its condition after a hard day's work punctuated with accidents. Only a complete wreckage of the cab would necessitate its stoppage in the depot for more than one night. In addition to washing, inflating tires, filling tanks, oiling, touching up paintwork, etc., there was such an organization that such serious accidents as the breakage of the crankage hangers, the rupture of the differential, or the changing of the gearbox, could be carried out between midnight and 10 o'clock the next morning.

The company buys its own tires, of 815 by 105 millimeters section, and by a systemized method of nightly examination and repair whenever necessary can get a much higher average in the hands of rough drivers than is possible by many private car owners. Two steel-studded tires are used, one on the rear, and the other on the opposite front wheel. To avoid the city water rates, artesian wells have been

bored and tanks erected capable of containing 100,000 gallons of water. Gasoline is bought in huge quantities and stored in underground tanks; big contracts are placed for tires; rags are washed and rewashed in the company's own laundry until they no longer are fit for use; all spare parts necessary are manufactured on the premises; wheels are constructed; bodies are made, upholstered and painted, and the annual overhaul required under the police regulations, and calling for the putting of the car in condition equal to new, is also done in the depot. In fact, the organization is such that it would be possible, if desired, to build complete cars.

It was difficult for the visitors to understand how the cabs could be made to earn a profit at the low rates in force. Yet the balance sheet shows that the leading companies can pay a dividend. Their task is not made easier by the police regulations. Before being put into service, every cab must pass a strict examination, the points inquired into being quiet operation, turning area, freedom from danger of fire—the magneto and carbureter must be on opposite sides—and the general condition of the bodywork. Not only is this standard insisted on when the car goes into use, but the license is not renewed at the end of the year unless the standard is maintained. Drivers must pass a searching examination into their knowledge of London. This is an additional drag on the companies, for it creates an artificial dearth of drivers, and makes it impossible to replace the man in case of labor disputes. Each cab travels 60 to 80 miles a day, two-thirds of this distance being on paying trips. The minimum earnings are \$8 per day, of which amount the driver will keep \$2. Deprecia-

tion is based on a period of 7 years, and according to the engineer in charge the cabs which already have been in service 3½ years are in every respect equal to new. The cabs cost from \$1,500 to \$1,700 complete. The recording instrument is not included in the amount, this being rented from the taximeter manufacturing companies and kept in repair by them on a yearly contract.

Banquet at the Trocadero

One hundred and forty persons, about forty of whom were members of the Society of Automobile Engineers, united at the Trocadero restaurant, Piccadilly, London, for the banquet given by the Institution of Automobile Engineers in honor of the visit of the Americans. The chair was occupied by L. A. Legros, M. Inst. C. E., and president of the Institution of Automobile Engineers. After the toasts of the king and the president of the United States had been cordially honored, F. W. Lanchester proposed the Society of Automobile Engineers, and H. F. Donaldson replied. The Institution of Automobile Engineers was proposed by Howard E. Coffin and replied to by Dr. H. S. Hele-Shaw. "Our Guests" was proposed by T. E. Browne and replied to by Edward B. Ellington and Sir George Gibb. The gathering, which was unique by reason of the uniting of all the leading English engineers and a very representative number of American engineers, was marked by the greatest cordiality throughout.

Take Ride in Fords

Typical London November weather prevailed when at 11 o'clock on Sunday morning about twenty Ford cars called at the headquarters to carry the entire party to Brooklands motordrome, about 20 miles out of town. The showers, however, were unable to dampen the spirits of the party,

and even the arresting of C. H. Foster, president and general manager of the Gabriel Horn Co., and a couple of the Ford drivers, for exceeding the speed limit, only served to add interest to the run. Over these perfectly surfaced waterproofed roads, in many cases with no indication of danger in sight, it was difficult to hold down exactly to the legal limit.

Lunch was taken at the Hut, Wisley, a typical English hostelry on the London to Portsmouth road, and in the afternoon the run was continued to the track, where a couple of hours were spent in racing over the cement surfaced speedway, climbing the 25 per cent test hill, and examining the unique timing apparatus. Owing to the weather conditions it was impossible for any aeroplanes to venture out.

After 6 days in London, practically the entire party moved northward to Coventry, a town which may very accurately be described as the Detroit of Great Britain, for it is here that about three-quarters of the English factories are situated. A number of cars being in waiting, the visitors were taken direct to the Humber factory, and after presentation to the general manager, H. G. Burford, were shown through the works. Originally devoted to bicycle construction, the Humber factory now produces motor cars, motor cycles and bicycles, the number of cars produced being about 2,000 per year, and the number of motor bicycles 4,000 to 5,000 a year, and a staff of 3,000 men employed. The buildings and plant are entirely modern, all the shops being on one floor, with north windows to the roof, and the cars passed through from one building to the other from the time of erection to the completely finished article.

Mechanics Young Men

The high standard of factory management, and the comparative youthfulness of the heads of important departments, came as a surprise to some of the members of the party, who had expected to find other conditions. The prodigality of labor,

compared with American methods, was noted, but was readily understood in view of the lower rates of wages paid. Among the features which attracted attention were the water brake for engine testing, and the use of a chain for driving the camshaft of the Humber motors. It was explained that the practice was to use a Coventry chain which had been run in on a jig for a fortnight without a stop, this being equal to road service of 10,000 miles. There would be a stretch of 1/16 inch on the length of the chain, but after this treatment no further stretch would take place, and no provision for taking up slack was provided on the motor.

Not content with showing the entire party through the factory, and taking them to and from the works in private cars, the Humber company entertained the American engineers to lunch at the King's Head hotel, under the chairmanship of D. F. Basden, president of the company; supported by Ballin Hinde, vice-president, and H. G. Burford, general manager. On the afternoon of the same day a visit was made to the works of Alfred Herbert, Ltd., one of the largest machine tool makers in England.

The greater portion of the second day's visit to Coventry was spent at the Daimler company's factory, the first one in Britain to be devoted exclusively to motor car construction, and at present the largest in England, the output being about 3,200 cars a year, and the entire staff numbering nearly 5,000 men. As is generally known, the Daimler company of Coventry produces Knight motors to the entire exclusion of the poppet-valve type, the motors being built for its own cars and for several other firms holding the Knight license but not yet in a position to produce sleeve-valve motors.

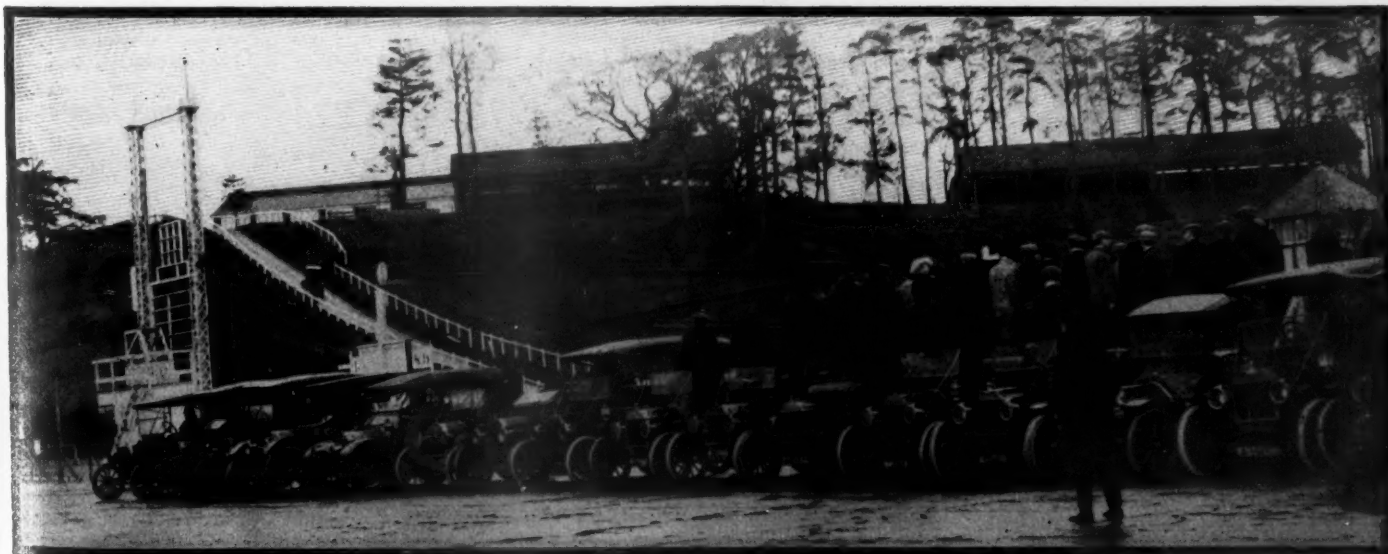
The works are most complete, everything in connection with the car, with the exception of tires and the magneto, being produced on the premises. No pains were taken to make the visit a profitable one, even the research department and the

laboratories being thrown open to the visitors and every facility afforded for obtaining information. Three large Diesel motors, used for generating current, attracted particular attention, as did also a gasoline-electric bus with two Knight motors, one on each side of the frame, with separate drive to each rear wheel. This is a type of bus which was prepared for service on the London streets, but owing to patent disputes with the London General Omnibus Co. had never been put into service. One of the buses was got ready on the arrival of the party, and was used for carrying the visitors to and from the works. Close attention was also paid to the heavy vehicle section of the company, a number of tractors and Renard road trains for service in the Argentine being an important feature.

Hospitable at Birmingham

For the second time the visitors were entertained to luncheon, the hosts on this occasion being the Daimler company, represented by Percy Martin, vice-president, in the chair, supported by E. M. C. Instone, the business manager, and by Charles Y. Knight. In replying to the toast of "The Guests," proposed by Charles Y. Knight, H. F. Donaldson echoed the sentiments of the whole party when he declared that they had considered London the apex of cordiality, for they had been received as cousins; but at Coventry they had been welcomed as brothers. There had been no need to exercise the functions of a peeping Tom, for everything had been thrown open to them.

A busy afternoon was occupied in visiting the wire wheel factory of the Rudge-Whitworth Co., where sets of wire and wood wheels were tested to destruction, examining the plant of the Coventry Chain Co., maker of most of the chains now used for driving camshafts, and in a run through Warwick, Kenilworth, and Stratford-on-Avon in Daimler cars supplied by Charles Y. Knight. One of the cars was the first six-cylinder Stoddard-Dayton Knight model, rated at 48 horsepower,



AMERICAN ENGINEERS WATCH CARS CLIMB TEST HILL AT BROOKLANDS



COFFIN TRIES TO PHOTOGRAPH ENGLISH RAINBOW

and was driven on the trip by Mr. Knight himself.

Birmingham tried to out-do Coventry in the matter of hospitality. When the members of the Society of Automobile Engineers arrived at the works of the Wolseley Tool and Motor Co. they found the stars and stripes flying side by side with the union jack and an open house and a glad welcome within. In size the Wolseley works rank second in England, the staff number about 3,500, and the average output being forty to fifty cars a week. The trade is high class throughout, while the factories are practically self-supplying, everything being constructed on the premises with the exception of tires and magnetos. The company has its own iron and aluminum foundries, has its frames made in an outside shop under its own management, and builds practically all its own bodies.

Daimler Company Entertains

Very close attention was paid by the visitors to the cutting of worm gears for final drive, the Wolseley company using the worm for its 12- and 16-horsepower models, and bevel gears for all the larger types. It was declared that the efficiency was equal on the two types, and that they had been able to make the bevel just as silent in action as the worm; this was due in a large measure to the method of hardening each tooth of the crown bevel wheel separately under an oxy-acetylene flame. Each wheel is mounted in a bath so that it can be revolved, and the tooth just on the surface of the water operated upon with the flame. It is declared that by this method all possibility of distortion of the bevel wheel is removed. The new case-hardening rooms with their pyrometers going direct to the laboratory, thus removing all responsibility for the temperature from the workmen, were examined with interest.

Quality Sought For

All members were struck with the enormous care taken to assure a high quality of work. There are traveling inspectors

in all the shops, and in addition a special staff of examiners in an isolated portion of the factory, who examine and pass all piece work. It is made impossible for there to be any communication between piece workers and inspectors. The bench tests of the motors are carried out in the usual way and as soon as a motor is passed as satisfactory it is torn down, examined, and washed piece by piece under a powerful jet of kerosene. Each chassis is taken on the road by three different testers, all of whom must fill in a very detailed report covering practically every portion of the mechanism, and stating the road and weather conditions under which the tests were carried out. When the car has been declared satisfactory it is again pulled down, examined for traces of wear, and finally assembled.

Although building in series, the factory pays close attention to individual requirements in the matter of the body and fittings. This is done under a fixed catalog price scheme; thus, although a standard type of car is presented to the public, the individual requirements of the owner can

be carried out in a very large degree without any extra cost. As examples, wood or wire wheels can be fitted; every individual owner and his passengers can be measured for seats, a special measuring chair being kept at the factory and in the hands of the leading dealers for this purpose; color requirements can be met, and a number of minor matters which may appeal to the individual may be incorporated without extra charge.

After the visit to the factory the official of the Wolseley company entertained the visitors to luncheon at the Grand hotel, Birmingham, the president on the occasion being Mr. MacCormack, general manager of the company, supported by Max R. Lawrence, works manager, and Mr. Royce. Birmingham being on the edge of the Shakespeare country, a number of cars were kindly placed at the disposition of the visitors for a run to Warwick, Kenilworth and Stratford-on-Avon.

A fitting official opening to the European trip of the Society of Automobile Engineers was the joint meeting with the members of the Institution of Automobile Engineers, at Storey's Gate, St. James's Park, London, under the chairmanship of L. A. Legros, M. I. Mech. E., president of the institution. On this occasion Howard E. Coffin read a paper on "Chassis Design," which was published in part in the last issue of *Motor Age*.

Discussion of Coffin Paper

The discussion which followed the Coffin paper was of a varied nature. As Secretary Coker F. Clarkson expressed it: "It was like old Mother Hubbard's gown; it went all round the subject without touching it at any point." In the course of the remarks it was elicited that whereas the average privately-owned American car would not cover more than 5,000 miles a year, the average European driver covered a distance of 12,000 miles every year.

Piloted by L. A. Legros, president of the Institution of Automobile Engineers, a small number of the visitors went to the South Kensington museum. The trip



ENGINEERS STOP FOR LUNCH AT THE HUT

proved far more interesting than was anticipated, for in addition to a very comprehensive exhibit of models relating to railroads, steamships, mining and general engineering, the bicycle and motor car industries were depicted from the time of the hobby horse up to Charles Y. Knight's motor, built by the Daimler company. The exhibition also comprised two of the earliest motor cars to be employed in England: a twin-cylinder Panhard, built in 1893, and a Benz, produced in 1900.

Look at Hele-Shaw Transmission

Most of the members who visited the South Kensington museum were taken out to this place on an Albion truck fitted with Dr. Hele-Shaw's hydraulic transmission. The demonstration was an interesting one, the truck proving itself remarkably responsive to the single-lever control, moving ahead or astern at any speeds from 1 to 15 miles an hour, and being stopped and started with remarkable facility. Dr. Hele-Shaw claims an efficiency of 89 to 90 per cent, and declares that there is no heating and practically no leakage.

There was direct interest in the work of the London General Omnibus Co., consequently a large party boarded the private buses which called at the St. Ermin's hotel by the courtesy of Mr. Iden, chief engineer of the company. A visit was first paid to one of the depots, after a long run through West London, and was followed by an inspection of the company's factory at Walthamstow. The company controls a fleet of 1,500 motor buses, representing 90 per cent of London's total, and after using vehicles constructed in practically every reputable motor car factory in Europe recently, came to the decision that best service could be obtained by building its omnibuses in its own shops. The outcome is the B-type of bus, which is the embodiment of the experience gained with the various manufacturers' vehicles. In no city in the world are the conditions more arduous than in London; for prior to putting any vehicle on the



H. F. DONALDSON AND PRESIDENT LEGROS AT BROOKLANDS

streets it must respond to the 390 points of the rigorous police regulations. The buses are four-cylinder models of 110 by 140-millimeter bore and stroke, valves on opposite sides, magneto ignition, thermo-syphon cooling, with plain tube radiator in front, circulating oil system, with troughs for the connecting rod ends, and plain bearings throughout the motor. A chain-driven gearbox is now used with final drive by propellershaft and bevel gearing, there being neither torque nor radius rods.

Police Are Strict

The chain-driven gearbox and bevel gearing have been adopted to meet the police requirements in the matter of silence. The company's experience has been that the same amount of service can be got out of spur pinions in the gearbox, but there is not the same degree of silence when running on the low gears; further, the changing of gears is easier, after a few hundred miles on the road, than with the use of meshing pinions. The gear ratio of the buses is at present $8\frac{3}{4}$ to 1, this having been adopted in order to pass the police examination on the hills. It

is a rather low ratio and is giving more trouble with the worm than when the previous ratio of $7\frac{1}{2}$ to 1 was used.

Oil dripping is forbidden in London, consequently the buses carry a sheet-metal pan suspended just below the gearbox, and catches whatever oil may leak out of the motor by a pan cast with the base of the crankchamber. This latter is found to give better service than an independent pan, for it is impossible for it to rattle, and it is one organ less to dismount in case of inspection.

Most of the drivers are old horsemen, who have to be encouraged not to meddle with the mechanism. In order to put temptation out of their way, the magneto is carried within an aluminum housing secured by a stout padlock, and the carbureter is sealed so that it is impossible to dismount any portion of it. The immunity from trouble is shown by the fact that in the depot visited the 130 buses had covered a distance of 94,000 miles with only nine involuntary stops, and in these were included such trifles as accidental closing down of the gasoline flow, fouling of plugs, etc. The gasoline consumption worked out at 8.8 miles per gallon for buses weighing 6 tons fully loaded, while the oil consumption was 316 miles per gallon. Rubber tires are paid for on a mileage basis of $3\frac{1}{2}$ cents per mile per set, the average life of the tires being 10,000 to 12,000 miles. In view of the method of payment, however, no particular emphasis was laid on long life for tires.

Steel Bus Wheels Favored

After a long experience with wood wheels, the London General Omnibus Co. has decided that steel wheels are best for their purpose; the type adopted was only arrived at, however, after considerable experimenting, the straight spoke wheels proving so brittle that according to the engineer "they snapped like carrots."

The greatest mechanical difficulty at present appears to be with springs, which are supplied by various home and foreign firms and are all equally unsatisfactory.



FINE PIECE OF ROAD ON WAY TO BROOKLANDS

Mechanical Features of Olympia Show

LONDON, Nov. 17—Herewith are more of the clever mechanical ideas at the Olympia show, some of which were described in the previous issue of Motor Age:

The attachment of such a device as the sketch, Fig. 1, shows is not novel, at the same time its advantages from the point of view of the driver's comfort are consid-

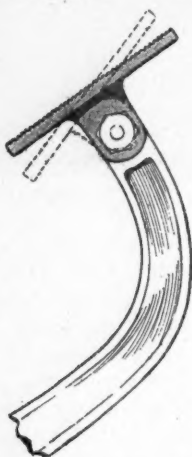


FIG. 1—CROSSLEY ADJUSTABLE PEDAL

erable, and it is not easy to see why the adjustable pedal plate is not more in use than it is. It is fitted on Crossley cars.

Fitzall Wrench

In the Fitzall wrench, Fig. 2, the adjustment is obtained by no screw or cam action, but by a quickly manipulated

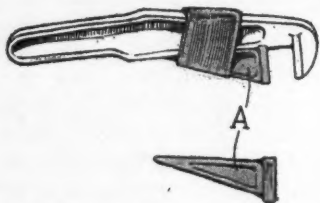


FIG. 2—FITZALL WRENCH

wedge shown at A. The tendency in pulling up a nut being to force the wedge into the retaining hood and hence in close contact with the spanner shank. While there is quick adjustment, therefore, there is small chance of slipping.

Aberdonia Flexible Coupling

The Aberdonia flexible coupling, Fig. 3, which occurs between clutch and gear

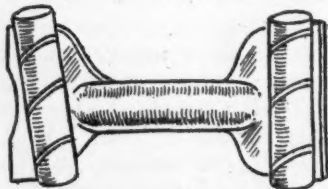


FIG. 4—ABERDONIA FLEXIBLE COUPLING

box, consists of a dumb-bell-shaped part having flat ends which engage in slots cut in pins, which latter permit movement

By J. S. Critchley

in one direction. Flexibility in the other direction is obtained by the action of the flat ends sliding in the slotted pins. As the lack of alignment is unlikely to be a great one the friction set up should not be serious, especially as the lubrication arrangements are good.

Crossley Fuel-Pressure Valve

There is more than one system of obtaining pressure for lifting the gasoline from the main tank and supplying it to the carburetor. Formerly this nearly always was done by the pressure of the exhaust gases and more recently by a special air pump driven from the cam shaft. Now Crossley Brothers have introduced a third method, viz., by the use of the gases obtained direct from the explosion chamber. The arrangement for draw-

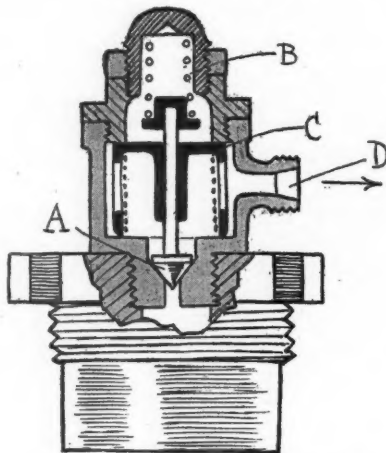


FIG. 3—CROSSLEY FUEL-PRESSURE VALVE

ing upon this pressure supply and filtering the gases comprises a neat and simple fitting which, as will be seen by referring to the sketch, Fig. 3, is screwed into one of the valve caps. A small conical valve A is loaded by a spring B; this valve is lifted by the explosion pressure and gas passes up through the small hole shown and on its way to the exit D passes the gauze screen C. It will be realized that the arrangement acts to some extent in the manner of a reducing valve; there is a safety valve, however, in the system to prevent excessive pressure. The spring pressure can be adjusted by means of the fitting at the top and the gauze filter screen can be withdrawn for cleaning.

Minerva Steering-Wheel Adjustment

It is usual when a chassis arrives at the body-builder's for treatment that the body-builder finds arrangements with regard to the position of the steering wheel fixed and unalterable. Under these circumstances the builder is practically tied down to a fixed dash-to-front-seat dis-

tance, sometimes to the detriment of the body. The makers of the Minerva cars have, however, seen fit to permit some latitude in this respect. The steering box, Fig. 4, is mounted in such fashion that it can readily be swung from the point A, which is the center of movement of the steering lever. This movement is performed simply by revolving the steering

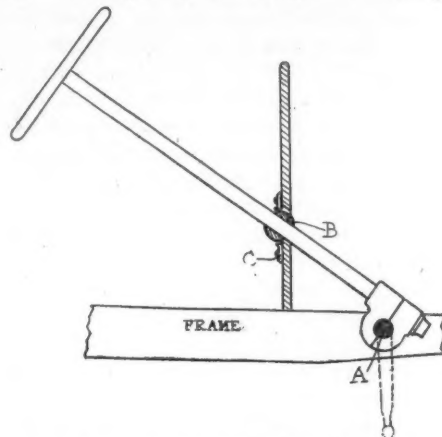


FIG. 4—MINERVA STEERING WHEEL-ADJUSTMENT

wheel, the other parts remaining stationary.

Instead of the usual worm sector there is a complete worm wheel contained within the case, so that this movement could, if desired, take place to any extent. The bracket which secures the steering column to the dash board and fixes its axle is in two parts, viz., B, a spherical and sliding part, and C, a square plate, having a central spherical seating, for bolting to the dash board. It will be clear from the above description that the spherical and sliding part B, together with the fixed plate C, will adapt themselves to suit any angle that the steering column may make with the dash board. The process of attachment becomes merely one of cutting a slot, to allow the steering column to pass, in a suitable position in the dash-board and of drilling the holes for the bracket bolts.

Side Lamp Positions

Mulliner, the coach builder, shows a somewhat novel position for the side

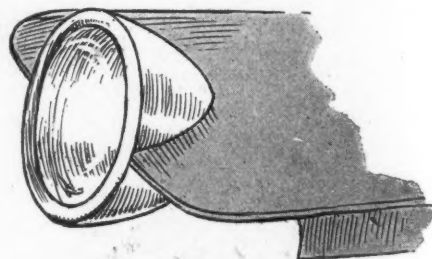


FIG. 5—SIDE LAMP POSITION

lamps. As the sketch, Fig. 5, shows, they are let into and supported by the wings and certainly afford a neat appearance,

though one would expect the lamps to suffer somewhat under wet and muddy conditions of travel.

Swift Clutch-Operating Mechanism

The Swift clutch pedal does not operate the clutch shaft in a direct manner, but

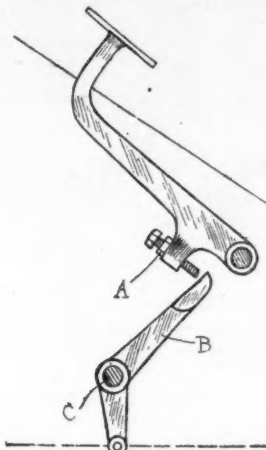


FIG. 6—SWIFT CLUTCH-OPERATING MECHANISM

has a boss upon its shank which holds a set screw A, Fig. 6. The set screw, upon depression of the pedal, acts upon the end of a lever B which is secured to the clutch shaft C. A large mechanical advantage is thus obtained and a light pressure upon the pedal suffices to declutch. It will be understood that the purpose of the set screw is to adjust the height of the pedal plate above the floor board as circumstances demand.

Bailey's Silencer

Bailey, of Salford, near Manchester, shows a somewhat novel form of silencer; it consists of a nest of cups, each one having a single hole placed out of center. The cups which are of steel about 18 S. W. G., are not stamped from dies, but are spun, so that when pulled up together by

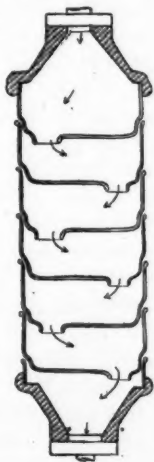


FIG. 7—BAILEY'S MUFFLER

three steel rods not shown in the sketch, Fig. 7, the joints are all perfectly gas tight. The cups are fitted together so that the holes are staggered, no two holes being therefore directly opposite one another. The effect of this is of course to reduce the velocity and pressure of the

gases in passing, and thus effect silence. Owing to the solid nature of the silencer when built up there is a complete absence of the ringing noise produced by some silencers. The apparatus can readily be taken to pieces for cleaning when necessary, and as there are no small perforations through which the gases must pass there is little likelihood of the silencer becoming choked with soot.

Hobson Shock Absorber

The Hobson shock absorber, Fig. 5, as will be seen, replaces the usual spring shackles, and is a strong and well designed piece of mechanism. The larger and the lower springs, A A, take the load and the smaller ones, B B, serve to cushion

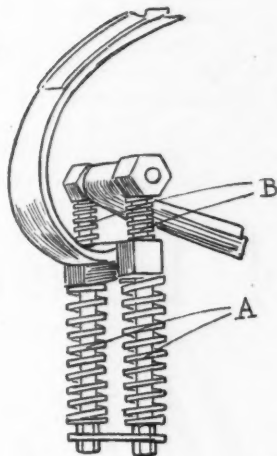
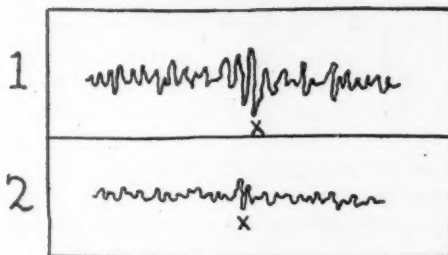


FIG. 8—HOBSON SHOCK ABSORBER

the rebound. The two diagrams show the results of tests made upon a car; No. 1, without the suspension system, and No. 2, with the system fitted. The diagrams are taken with a trepidometer and illustrate very forcibly the advantages of the shock absorber. The point marked with a cross indicates the passage of a level crossing and here the difference between the two cases is most marked. The device can be fitted to almost any car in quite a few minutes, and is perfectly accessible for cleaning.

Dallison Safety-Starting Handle

There are two methods of overcoming possible engine starting difficulties. Firstly, by the employment of a self-starter, which is expensive, but satisfactory; and secondly, by the employment of some kind of safety-starting handle, which though far less satisfactory, in any case insures personal safety. The Dallison handle, shown in Fig. 9, is intended to

attack the problem in the latter fashion. The boss A is fixed by the set screw shown to the engine crank shaft end, and has a small gear wheel upon it. The boss B rotates free upon the inner boss and carries an arm and handle, which arm is hinged at

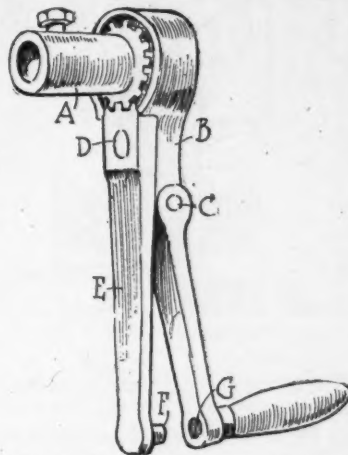


FIG. 9—SAFETY-STARTING HANDLE

C and has a spring, not included in the illustration, to maintain the arm in the position shown. A second arm E is pivoted at D and has a projecting pin F, which can be made to engage with the hole G. This arm has as well, at its inner end, a few teeth to engage with those of the pinion. To start the engine the handle is rotated until the two arms are coincident, the handle is then pushed inwards and the pin engages in the hole G. Rotation of the handle now puts the crank shaft in motion. If a back fire takes place the shock causes the peg to slip out of its engaging hole and the arm E takes all the movement through the medium of the tooth and pinion engagement.

Sheffield-Simplex Cam Gears

Many engines are now fitted with a short radius link between cam and tappet piece to relieve the latter of all side thrust put upon it by the cam, Fig. 10. These levers have usually a flat or slightly

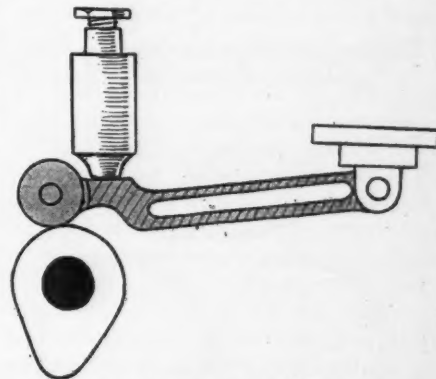


FIG. 10—SHEFFIELD-SIMPLEX CAM GEARS

curved nose that rests upon the face of the cam. In the Sheffield-Simplex engine the radius links are provided with rollers so as to entirely eliminate wear. The tappet is operated by a flat surface situated just behind the roller. This method of construction is common enough in large

engines, but the writer does not recollect having seen it applied to the small high-speed engine before.

Crossley Valve Tappet

Improvement in the modern car has become very much a question of improvement in minute detail at the present day,

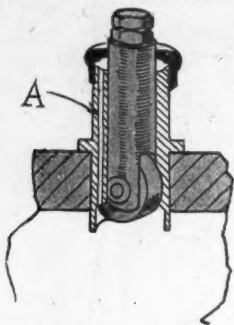


FIG. 11—CROSSLEY VALVE TAPPET

so that the somewhat trifling detail shown in this sketch, Fig. 11, of the Crossley valve tappet, may be worth bringing forward. To prevent oil being worked out of the tappet guide by the reciprocating action of the tappet, the top of the guide has a countersink, a screwed cap over it and a small return oil hole, as shown in the sketch.

Hotchkiss Fan Adjustment

The sketch, Fig. 12, shows one of the many arrangements to be seen at Olympia for permitting adjustment of the fan belt, and is seen on the 18-22-horsepower Hotch-

kiss. The block A, which holds the fan-bearing spindle, is supported by a square-headed screw, and slides against one side of the forked bracket B, the arrangement

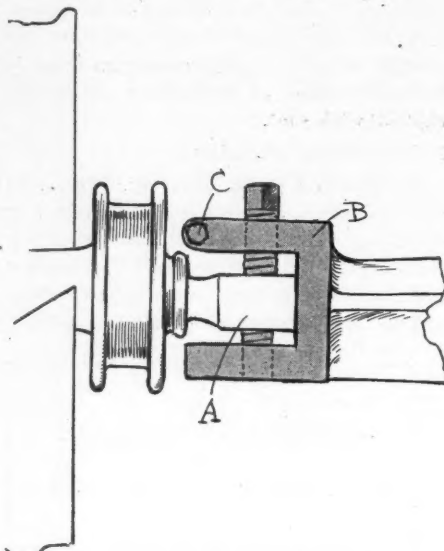


FIG. 12—HOTCHKISS FAN ADJUSTMENT

being very similar to that adopted in some makes of adjustable spanners. The vertical tension adjusting screw is locked in position by the clamping screw, C.

Vauxhall Steering Arm Stops

The sketch, Fig. 13, shows that stops are attached to the Vauxhall frame in proximity to the vertical steering arm.

These stops are mounted somewhat eccentrically upon their supports, so that the distance between them can be restricted. This appears to be as simple and readily accessible a method as any of preventing an excess of lock and consequent tire damage.

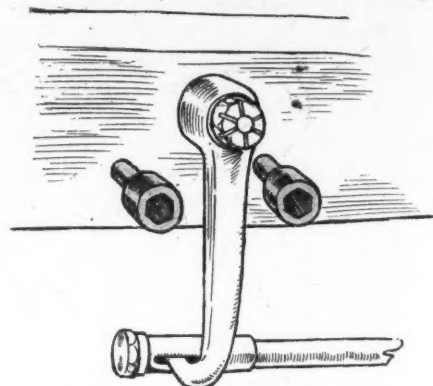


FIG. 13—STEERING ARM STOPS

The set screws limiting the angular movement of the worm quadrant are not always very accessible.

The above are only a few of the refinement of detail for which English cars are noted. American engineers at the show made a careful study of them all and doubtless will draw interesting comparisons upon their return home. They show to what extent the British designers have gone in their effort to make motoring easier for the owners, an effort which is appreciated throughout the kingdom.

Three Types of Foreign Carbureters

THE Napier carbureter, Fig. 1, as an example of the existing tendency to simplify all parts which are likely to need attention from the car owner and to render any adjustment which may be necessary an easy and accessible matter. The float chamber F is arranged concentrically with the jet chamber, in a manner similar to that first adopted by de Dion Bouton. Gasoline is supplied to two jets, N and N1, of different sizes, above which are tapered choke or venturi tubes that can be removed for alteration when the carbureter is first adapted to its particular engine. On the smaller jet N a sleeve will be observed, actuated by a bellcrank lever and capable of a sliding motion until impeded by the lower portion of the choke tube. In this position engine suction can only draw air between the inside of the sleeve and the external circumference of the jet, thus concentrating around the jet nozzle, which therefore delivers a greater quantity of gasoline than it would supply normally. A considerable quantity of gasoline flows down the jet sides and is retained by the top of the sleeve, forming in effect a small surface carbureter from which a very rich mixture is obtainable and facilitating easy starting. Once the engine has been started, the sleeve can be lowered and the jet operates in its usual

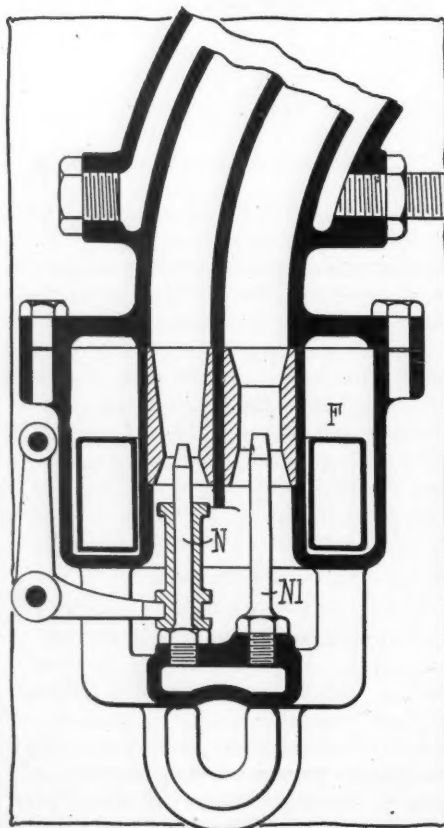


FIG. 1—NAPIER CARBURETER

manner until it is cut off and the larger jet uncovered by the throttle position necessary for increased speed.

The double-spray pipe casting is furnished with a hot waterjacket, the inlet to which is seen in the drawing, the outlet pipe being placed slightly below the throttle at a point where the pipe is branched to the cylinders. While the enriched mixture is necessary for starting purposes, it is conceivable that it might become too rich by this arrangement should the engine require much swinging, but this is a drawback appertaining solely to the novice and easily overcome with experience.

The Rex Carbureter

In the Rex carbureter, Fig. 2, the bore of the jet N below the nozzle is unusually large so as to afford immediate response to accelerations of the motor. The position of the jet obviates accumulations of gasoline spilled from the nozzle. Suction takes place through the bushing B, which is anchored by the locknut C as soon as the proper regulation of the mixture has been found. The gas admission is regulated by an iris diaphragm of the Lacour-Berthiot type, which is double in order to obtain a rigid wall. It is controlled by means of the sleeve ring D which turns round the body of the carbureter. The spring, button E on ring D carries a

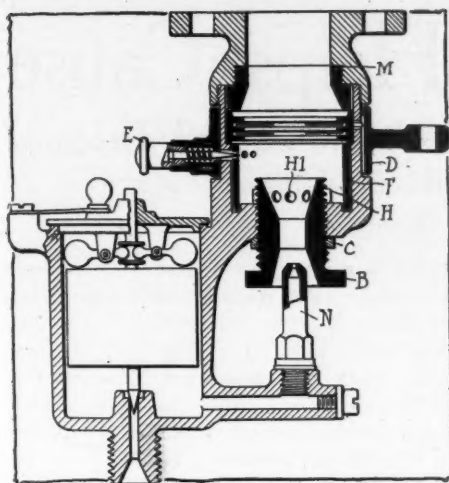


FIG. 2—THE REX CARBURETER

pointed shank which may be let into one or another of several small holes in the auxiliary air collar F, thereby bringing the opening H in the latter in one relation or another to the holes. H1 is the upper cone of bushing B. This mechanical adjustment of the additional air supply is intended only for the higher power developments. The adjustment of collar F is apparently effected at openings in the outer wall of the carbureter not shown in the drawing. Above the iris diaphragm a metallic screen M obviates carbureter fires while aiding in perfecting the mixture.

This carbureter design can be worked out in very small dimensions, and the jet can be easily unscrewed, says the September Bulletin official. The iris-type of diaphragm with its central opening obviates the formation of eddies at starts and accelerations. At a trial in the laboratory of the Automobile Club de France, this carbureter gave 8.81 horsepower at 1,356 revolutions per minute with a gasoline consumption of 0.57 liters per horsepower-hour; being mounted on a four-cylinder motor of 75-millimeter bore, 120-millimeter, or 2.95 by 4.72 inches, stroke and with automatic intake valves.

The Fiat Carbureter

One noticeable example in the simplification of motor parts which was referred to in Motor Age recently, is the incorporation of the carbureter into the cylinder castings, it being located in a four-cylinder motor between the second and third cylinders, its location here separating the cylinders sufficiently to give a long central bearing for the crankshaft.

In order to more clearly show the constructions of this design, which is a Fiat invention, the three illustrations, Figs. 3, 4, 5 and 6 from the original patent papers are shown. Fig. 3 shows the monobloc motor casting with the carbureter integral with it; the position of the nozzle N and the throttle T being simply indicated. Fig. 4 is a plane section showing how the throttle is located and how the car-

bureter is on the side of the casting opposite to the valves. This arrangement allows of the throttle being well warmed between the cylinders as well as being incorporated within the waterjacket spaces J.

In Fig. 5 the general layout is shown. The float chamber F is at the left, and communicates with the two nozzles N and N1, each of which has a separate tube connecting with the throttle compartment. Air enters by the passage A past both nozzles. The throttle T is a simple rotating barrel type. The incorporation of the intake manifold M within the cylinder casting is quite clearly shown. The patent claims on this arrangement are two, as follows:

1—An internal combustion engine having a carbureter arranged in castings which are in one with and between two cylinders substantially as and for the purposes hereinbefore described.

2—An internal combustion engine having a carbureter combined with the cylinders substantially as hereinbefore described and illustrated.

In the preliminary description of the patent the object of the device is out-

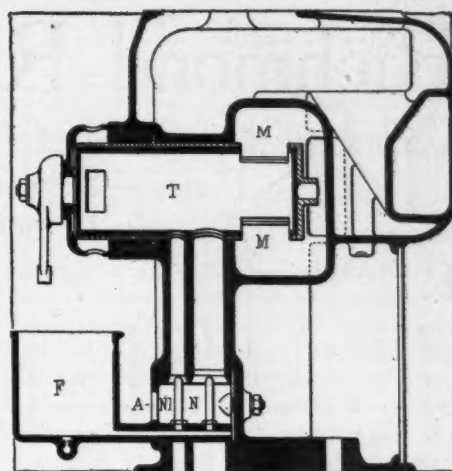
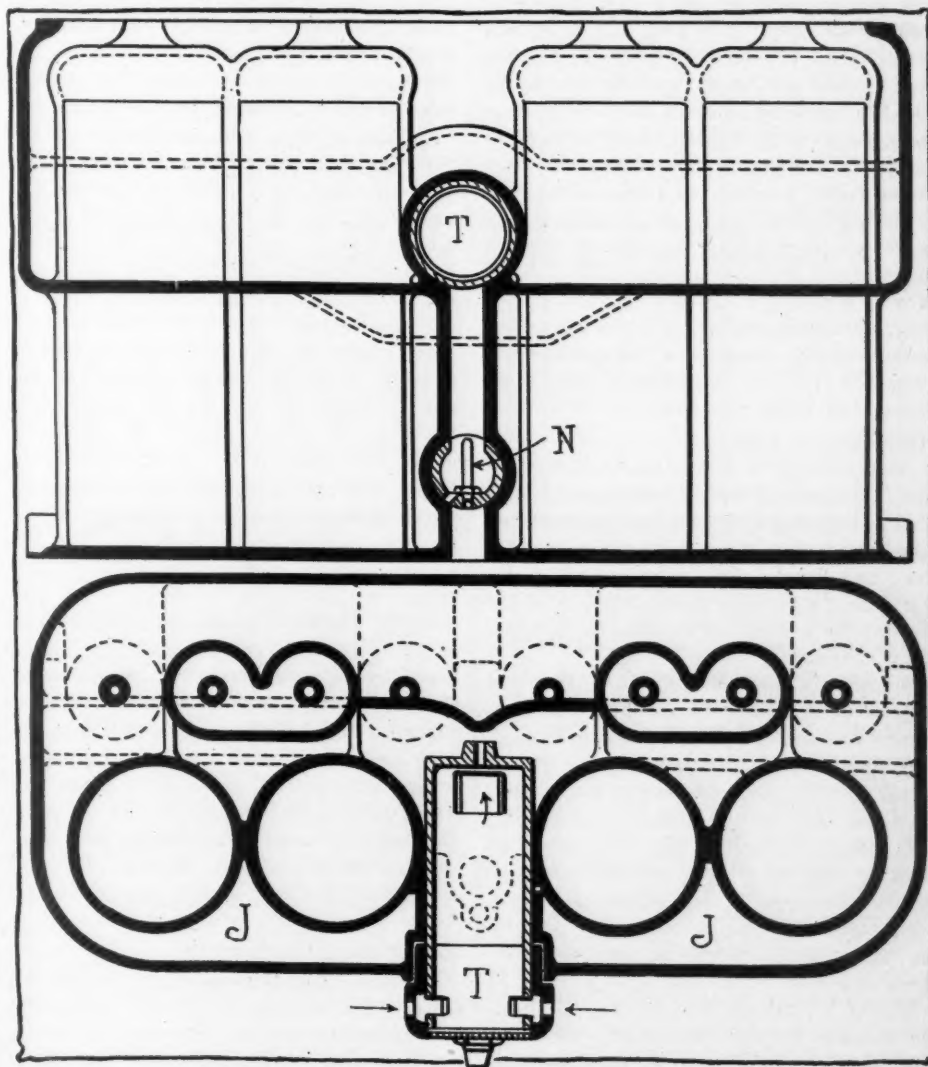


FIG. 5—FIAT CARBURETER

lined as: "To render unnecessary the arrangement heretofore employed for heating the combustible mixture, which arrangements are cumbrous, expensive and generally unsightly." The heating of the carbureter with its adjuncts is effective according to this invention by being introduced into the combustion chamber through passageways in the motor casting.



FIGS. 3 AND 4—FIAT CARBURETER

The feature of this device is that the carbureter is incorporated into the cylinder castings, being located between the second and third cylinders

Richmond Road Congress Helps Cause

Leading Civil Engineers of Country Attend Session and In All There Are 500 Delegates Present—Secretary of State Lazansky of New York. and Colonel W. D. Sohier of Massachusetts Among the Speakers

RICHMOND, Nov. 23—The 4-day convention of the first American road congress of the recently organized American Association for Highway Improvement ended in this city this afternoon with the election of officers for the coming year. The sessions proved to be of interest from start to finish. More than 500 delegates from all of the states and territories of the union attended and the discussions following the different addresses proved how much attention is being devoted at present to the good roads movement.

The 2 opening days of the convention were given over to the road builders, many of the leading civil engineers of the country being present; in fact, more of these attending than at any previous road congress. A novel feature of the convention, and one which appealed specially to motor car owners was the third day, known as road users' day. The program for it was handled by the Touring Club of America and it had gathered together several of the leading legal lights in the country who have to do with motor car legislation, as well as not a few of the leading car manufacturers. Among the legal representatives were Edward Lazansky, secretary of state, of New York; Matthew S. Rogers, secretary of state, Connecticut, and Highway Commissioner Colonel William D. Sohier, of Massachusetts. In the motor car manufacturing field were Colonel Clifton, president of the Automobile Board of Trade and Hugh Chalmers.

Regulation of Traffic

Major Richard Sylvester, president of the International Police Association, spoke on the regulation of traffic in cities. Other speakers were Sidney S. Gorham, of Chicago and Preston Belvin, president of the Virginia Automobile Association, who delivered the address of welcome to the visiting motorists.

Special interest attached to the addresses of Colonel Sohier and also of Secretary Lazansky, both of whom presented statistics to show the present status of the motor car in their respective states and sections. In the year 1901 there were 954 cars registered in the Empire state, whereas this year there were upwards of 85,000. Nearly 34,000 chauffeurs have been registered and in other departments the progress has been in keeping with these figures.

Basing his calculations on these figures, the speaker showed that today there is approximately \$85,000,000 invested in cars in the state and that a little over \$42,000,000 is expended annually in maintaining these.

In speaking on the number of cars owned throughout the country Secretary Lazansky based his figures on the data obtained from the government figures which showed up to the present a registration in thirty-five states of approximately 517,000 registered cars, of 174,000 registered chauffeurs and total receipts from registrations of \$3,746,938. This shows the enormous revenue received from the car business and shows what might be accomplished were this turned bodily into the road building business.

Colonel Sohier spent most of his time showing the number of cars in use in Massachusetts as compared with horse vehicles and also proving the point that motor vehicles cause many fewer accidents per mile traveled than trolley cars. He brought out the amazing fact that horses are decreasing in use in the big cities but gaining in use in the country, but when the totals are looked into it is found that the horse is on the decline so far as numbers in use in Massachusetts is concerned.

Colonel Clifton was reminiscent of the early days of motoring to show the conditions of roads when the New York-Buffalo and New York-Pittsburg tours took place. He used this as a basis for showing that since the inception of the car industry the car maker has always taken the attitude of coöperation with the different good road organizations. He showed that 3 contests had done much to stimulate the good roads cause as well as the actual building of good roads. The different motor car organizations today stand ready to do their part in this work and many of them have done good work up to the present. He urged for coöperation in the entire field of those interested in the movement.

Hugh Chalmers showed how that the motor car is not the only industry that is benefited by good roads, but cited how it costs 23 cents a mile to handle a ton of goods on the American roads as compared with less than 10 cents a mile on European roads. On some of the English roads entering London where motor trucks are used the cost is less than 4 cents per mile. If the freight bill of this country could be cut in half it would mean a saving to the people of \$250,000,000 a year.

Cost of Road Construction

In speaking of the cost of building modern roads in different sections of the country, he brought out the fact that in North Carolina and South Carolina macadam roads can be built for \$1,800 per mile; and that in nine states in the south the average cost of macadam roads approximates

\$4,000 per mile. In southern Ohio bituminous macadam roads cost \$7,000 per mile; in Massachusetts the average macadam road costs \$8,000 per mile and in New York state the new roads are costing \$9,000 per mile. Ohio has some brick roads which cost the state from \$10,000 to \$14,000 per mile.

Colonel Sohier's Speech

Following is an extract of Colonel Sohier's address on motoring conditions in the state of Massachusetts:

It is well to consider what the character of the travel that is using our highways at particular points is, and how that travel is likely to develop in the future. In 1909 the Massachusetts highway commission made a traffic census of the vehicles using state highways. The passing vehicles were actually counted at 240 stations upon our state highways scattered throughout the state for 14 hours a day, 7 days in August and 7 days in October. They were classified into heavy and light horse-drawn vehicles, and the motor vehicles were divided into touring cars and runabouts. At that time the motor truck had not appeared. A table gives a summary of this traffic census. The actual count showed that on some of the roads the motor vehicles, even at that time, constituted 90 per cent of the traffic, and in several instances over 1,100 cars a day passed a given point. A census was taken at certain places in the parkways near Boston and this count showed over 60 per cent car travel, and over 3,000 cars a day. Even at that time, therefore, on many of our highways, especially on the main routes, it was found that the motor vehicle constituted more than one-half of the travel.

AVERAGE DAILY TRAFFIC—ALL STATIONS

	August census	October census
Horse-drawn—		
Light	19,622	16,456
Heavy	17,969	17,967
Total	37,591	34,423
Motor cars—		
Runabouts	5,922	3,995
Touring cars	21,387	14,514
Total	27,309	18,509
All kinds	64,900	52,952
Per cent horse drawn	58	65
Per cent motor cars	42	35
Averages per station*—		
Horse-drawn:		
Light	83	69
Heavy	76	75
Motor cars	159	144
All kinds	115	77
	274	221

*In August, 237 stations; in October, 240 stations.

ACCIDENTS UPON STREETS.

I thought it would be of interest to ascertain as accurately as possible the cause of the various accidents which occur in our streets and highways, how many of them were due to traffic, how many to other causes, and of those due to traffic what proportion were due to the motor vehicle and what proportion were caused by other classes of vehicles using our highways. At my request, many of the following figures were collected and collated from official reports by George McClure Sargent, secretary of the Safe Roads Automobile Association of Massachusetts.

Motor car accidents throughout the country were receiving an undue share of notoriety. They were given scare headlines in the papers, partly because this is a new means of locomotion, and partly because of the prominence of the people occupying the cars. I think this matter will be of some interest to you. Please remember that of all the motor car accidents which we were able to hear of and record, 960 of the total of 1,182 accidents in 1910 occurred in city streets. In other words, four accidents occurred in city streets to every one that occurred in the country.

The figures submitted by Mr. Sargent were taken from the reports of the police commissioner of Boston and of the railroad commissioners of the state of Massachusetts. As the

months reported on do not exactly correspond, I have made them as nearly as I could to represent the same period of time as is covered by the report of our commission.

During the year ending November 30, 1910, according to the report of the police commissioner, the following number of people were killed and injured in the streets, parks and squares of Boston:

Total number of people killed..... 94
Total number of people injured..... 2,025

Due to traffic—
Deaths 50
Injuries 1,022

In other words, only about half of the deaths and only half of the injuries were due to traffic. Very few of these injuries were due to fire engines, bicycles and trains, so these figures are omitted.

Deaths and Injuries Due to Traffic

Total number of deaths..... 50
Due to horse-drawn vehicles, 151, or 30 per cent.

Due to trolley-cars, 22, or 44 per cent.
Due to motor cars, 13, or 26 per cent.

Total number of injuries..... 1,022
Due to trolley-cars, 383, or 37½ per cent.

Due to horse-drawn vehicles, 359, or 35 per cent.

Due to motor cars, 280, or 27½ per cent.

In this same period of time various other accidents were due to other causes, by far the largest of which was falls, resulting in twenty-three deaths and 777 injuries. In other words, there were nearly twice as many deaths and nearly twice as many injuries in the streets of Boston which were due to people falling in the street and being injured than were due to motor vehicles.

It is a little hard to make comparisons, because the numbers of electric cars, horse-drawn vehicles and motor cars is not really a fair criterion. The mileage should also be taken into account. To make a comparison today we should consider the growth of the number of motor cars using our streets:

In 1903, 3,241 motor cars were registered in Massachusetts.

In 1909, 23,902 motor cars were registered in Massachusetts.

In 1910, 31,347 motor cars were registered in Massachusetts.

In 1911, 38,677 motor cars were registered in Massachusetts.

At least 5,000 dealers' cars are registered as well. Since our traffic statistics were taken the number of cars registered in the state has increased over 60 per cent.

In Massachusetts, in 1909, about 169,000 horses were assessed, and in 1910 about 165,000. In this 1 year, the number of horses assessed had decreased 4,000, and the number of cars registered had increased 7,400. Undoubtedly, there is more of a change this year. I merely put in these figures as preliminary to further consideration of to what extent the motor car is responsible for the accidents which occur on our highways. It is evident to-day that they constitute fully 50 per cent of all the vehicles that are passing over our highways.

Mileage of Motor Vehicles

To ascertain the mileage covered by motor vehicles in Massachusetts, one must adopt a somewhat arbitrary formula. I have adopted one which I believe to be conservative, and, if anything, I think it does not show sufficient mileage for the motor vehicles.

Assuming that each motor car registered for a full year has a mileage of 5,000 miles; that each car registered for 3 months has a mileage of 3,000 miles, and that the five cars registered by each dealer have a mileage of 10,000 miles per year, we find that the motor cars traveling over the roads in Massachusetts went in 1 year 185,806,000 miles.

This leaves out of account the fact that fully one-third of the cars in our state for 2 or 3 months in the summer are non-resident cars, entitled to use our highways freely for 10 days, provided the state in which they belong grants like privileges to citizens of Massachusetts. I might say that this privilege is granted to non-residents by all of the New England states, without exception.

It is interesting to compare upon this basis of mileage the accidents occasioned by trolley cars and the accidents occasioned by motor cars. The trolley car mileage and accidents are both official figures taken from the railroad commissioners' report.

Trolley cars, miles traveled..... 87,712,572

Fatal accidents—

Passengers and employees..... 28

Outsiders 78

Total 106

Injuries—

Passengers and employees..... 5,273

Outsiders 1,917

Total 7,190

Motor Vehicles, miles traveled..... 185,806,000

Fatal accidents—

In motor vehicles..... 25

Outsiders 52

Total 77

Injuries—	
In motor vehicles	378
Outsiders	585
Total	963

Assuming that the above mileage for motor vehicles is correct, we should have the following results:

Miles Traveled by Trolley cars and Motor Vehicles to Each Ensuing Accident

	Trolleys	Motor Vehicles
Miles per accident to any one, including fatal cases	12,053	178,660
Miles traveled per fatal accident	827,477	2,413,065
Miles traveled per injury	12,199	192,945

Accidents to Persons Who are Not Employes or Occupants of Cars

Miles traveled per accident	44,389	291,689
Miles traveled per fatal accident	1,124,520	3,573,192
Miles traveled per injury	45,755	317,617

Accidents to Employes and Occupants of Cars

Miles traveled per accident	16,546	461,057
Miles traveled per fatal accident	3,132,449	7,432,240
Miles traveled per injury	16,634	491,577

From the above table it will be seen that there is only one accident for every 12,000 miles covered by an electric car, and only one accident for every 178,000 miles traveled by a motor vehicle.

That an electric car has to travel over 800,000 miles before causing a fatal accident and a motor vehicle has to travel over 2,400,000 miles before causing a fatal accident. In other words, a motor vehicle travels 3 miles to each fatal accident to each mile traveled by an electric car.

Now as to injuries—a motor vehicle travels nearly 193,000 miles before causing any injury, while an electric car travels only a little over 12,000 miles before causing an injury. You will note again that the motor vehicle goes 16 miles to the trolley's 1 before it causes any injury.

The figures are equally striking when applied to accidents which happen to persons who are neither occupants of cars nor employes. Here the motor vehicle travels over 290,000 miles to each accident and the electric car over 44,000 miles. The motor vehicle travels over 3,500,000 miles to each fatal accident, and the electric car 1,125,000 miles. The motor vehicle travels over 317,000 miles before causing injury and the electric car travels only 46,000 miles. Here again you will note that the motor vehicle travels 7 to 8 miles before causing any accident to any one outside of the car itself to each mile that is traveled by the electric car. Considering the fact that the electric car is always traveling upon rails and upon its own location, and that every one knows where to find it in the highway, it is significant that the electric cars are responsible for many more accidents for each mile traveled than are motor vehicles.

As I have no figures to show the mileage of teams in the state or the accidents caused by teams, I can only refer you to the figures in Boston which show the accidents occurring in the streets from all causes. I might say in passing, however, that applying our actual traffic census, and taking the number of horses assessed in the commonwealth, and assuming that each horse travels on an average of 10 miles a day for 365 days in the year, the mileage made now by motor vehicles and that made by horses would not be very different.

I do not give any of these figures in order to in any way condone the fault of the reckless and inconsiderate operator of motor vehicles. There are altogether too many of them upon the roads, although, in my opinion, their number is constantly decreasing. The vast majority of motor vehicle operators and owners are careful, considerate of the rights of others, and, as I have shown above, they are, I think, no more of a danger to other users of the highways than are the electric cars and horse-drawn vehicles. This brings me to the class of users of our highways about which I was requested to speak—the motor vehicle and its regulation in Massachusetts.

Let me state at the outset that motor car regulation in Massachusetts is first determined by statute and then regulated by the Massachusetts highway commission, of which I have the honor to be a member.

No person can operate an unregistered motor vehicle and no person can operate a motor vehicle without having received a license from the Massachusetts highway commission. The commission may revoke a license, after due hearing, for any cause it may deem sufficient; and it may suspend a license, without a hearing, whenever it has reason to believe that the holder thereof is an improper or incompetent person to operate motor vehicles or is operating improperly or so as to endanger the public; and the license shall not be reissued unless the commission, upon examination or investigation, or after a hearing, determines that the person should again be permitted to operate.

This law has been in effect since 1903.

In 1908 the commission was authorized by law to investigate motor car accidents. When-

ever a death results from any such accident, the commission shall suspend forthwith the license of the operator of the motor vehicle involved, and it shall revoke said license unless after an investigation or hearing, it determines that the accident occurred without serious fault upon the part of the operator. No person whose license is so revoked shall be licensed again within 6 months from date of suspension, nor thereafter except in the discretion of the commission.

The commission shall revoke the license of a person three times convicted of overspeeding in any one calendar year; and no new license may be issued to such a person until after the expiration of a period of 30 days from the date of the third conviction. Acts of 1909.

The commission shall revoke the license of any person convicted of operating a motor vehicle recklessly, or while under the influence of intoxicating liquor, or so as to endanger the lives or the safety of the public; or upon a bet, wager or race; or for the purpose of making a record; or of going away without stopping and making himself known after causing injury to person or property; or of using a motor vehicle without authority; and no new license shall be issued to any such person before the expiration of a period of 60 days from the date of conviction nor thereafter except in the discretion of the commission.

Whenever any person so convicted appeals, the commission shall suspend the license of the person, and shall not reissue said license unless such person is acquitted in the appellate court, or unless the commission in its discretion, after an investigation or hearing, decides to reissue it. Acts of 1906 as amended.

The commission, by law, has the right to appoint investigators and examiners. It has appointed seven such investigators and examiners and they are among the most competent men of their class to be found anywhere. These examiners examine every chauffeur before he receives a license. He is required to pass a written examination and also to pass a severe operating test on the road.

Examinations held in 1910..... 5,433

Number of persons examined..... 4,138

Number of persons receiving licenses..... 3,701

Number of persons failed on first examination..... 1,268

Number of persons refused a license after several examinations..... 437

In other words, over 10 per cent of all the persons examined failed to receive a license, and nearly 25 per cent of all the persons failed to pass upon the first examination.

During the year 1910 its investigators made investigation and reported 429 accidents. In that year 283 licenses or registration certificates were revoked or suspended. The causes of these revocations and suspensions were shown in the following table:

Reckless operation..... 50

Operating while under the influence of intoxicating liquor..... 22

Accidents resulting in death..... 57

Improper operation..... 88

Refusing or neglecting to stop after accident..... 9

Three overspeeding convictions..... 8

Operating motor cars without owner's permission..... 23

Other offenses..... 26

Total..... 283

The commission has authority to suspend the license of an operator when it has reason to believe that he is an improper person to operate or is operating improperly. It is required to hold hearings whenever requested by complainants or by operators. During the year 1910 the commission held 197 of such hearings. Each hearing takes anywhere from 15 minutes to all day and the hearings occupy certainly the whole of 1 day in each week. In 11 months of the year 1911 the commission has held 243 hearings. During the same period it has suspended 172 licenses and has revoked ninety-two licenses.

I wish to say that the passage of these laws, although suggested and recommended by the committee appointed at the conference of the New England governors held in 1908 to prepare a uniform motor vehicle law for the New England states, which law has already been passed in substance by all but one of the New England states, was accomplished largely through the active interest and ardent cooperation of the officers of many of the motor car associations.

Lewis R. Spears and the officers of many motor car associations in Massachusetts, including those representing dealers, private owners, tourists and chauffeurs, appeared publicly and advocated the passage of these regularity laws, and the granting to the highway commission of these summary powers. They did this, believing it to be for the best interests of the road users of the commonwealth of Massachusetts and believing that while the motorists and drivers of horsedrawn vehicles were fully entitled to all their rights, and that their interests should be carefully safeguarded.

The following table of accidents which occurred in Massachusetts in 1909 and 1910 may be of interest:

	1909.	1910.
Number killed	54	77
Number injured	989	963

Number of accidents	1,130	1,182
Number of accidents, day time	826	867
Number of accidents, after dark	304	315
Number of accidents on country roads	314	222
Number of accidents on city or town streets	816	960

In 10 months of the year 1911 there were 1,229 such accidents. In this connection it must be remembered that in 1909 something under 24,000 motor cars were registered in Massachusetts and that in 1911, allowing only five cars for each dealer, there were something over 42,000 cars registered. In other words, the number of cars using our highways has increased in that 2 years something over 60 per cent. The number of accidents has only increased about 10 per cent.

It may be interesting to see what, in the opinion of the commission, after careful investigation and report upon all the evidence, was the cause of some of the more serious of these accidents. I have made an abstract of a few of the more serious accidents.

Total number of accidents investigated and acted upon	278
Operator without fault	110
Other party to accident more to blame than operator, but operator not blameless	20
Operator more to blame than other party to accident, but latter at fault also	24
Operator entirely to blame	114
Both operators equally to blame	10—278

You will note that after a full investigation, involving a statement taken from all of the witnesses and a careful report from our investigator, and consideration by the commission, in nearly 40 per cent of all of these accidents the operator was not to blame.

In these days, naturally, we hear a great deal about motor car accidents and the reckless driving of operators. Certainly there is altogether too much reckless operation and altogether too many drunken, careless operators are allowed upon the road and there are altogether too many joy rides. I have outlined above what we are doing in Massachusetts in our attempt—and it is a serious attempt—to eliminate such operation.

I feel sure that in Massachusetts we shall have in the future as we have had in the past, the active coöperation of and efficient help of all of the officials and members of our various motor car associations. We are coöperating so far as possible with the authorities in other states by sending to them reports of the improper operation of their residents on the highways of Massachusetts. As a result of this action on our part the authorities of our neighboring states have many times held hearings and suspended or revoked the licenses of their operators. We are doing the same whenever we receive evidence that one of our Massachusetts operators has operated recklessly or improperly in any of our sister states.

Here, again, we are having the active coöperation and efficient support of the officers of the motor car associations. More can be done and should be done and I can assure the convention that we in Massachusetts will do all in our power to insure fair treatment and even considerate and courteous treatment to all of the users of our highways whether they are motorists, pedestrians or drivers of horse-drawn vehicles.

I feel sure that the authorities of Massachusetts will coöperate to the fullest extent with all the associations and all officials who are interested in making our roads safe and who will help in taking off of these roads the drunken, careless and reckless operator who is now doing so much to injure the reputation of the vast majority of motorists who are not reckless and who are considerate of the rights of the users of our public highways, to the end that we may secure safe highways and sane motoring.

NEW PLATTE BRIDGE COMPLETED

Plattsmouth, Neb., Nov. 27—There was a big gathering of motorists and good roads enthusiasts here last week to attend the formal opening of the new bridge across the Platte river at Plattsmouth and the organizing of the Omaha-Kansas City Good Roads Association. A delegation of 100 came down in cars from Omaha, and there were also delegations from Auburn, Union, Nebraska City, Atchison, Kan., and other towns. With the completion of this bridge, a direct route to Kansas City down the Nebraska side of the river is opened to motorists.

At the meeting held in the opera house S. A. Searle, Omaha, was elected president and H. R. Howe, Auburn, secretary.

Progress of the Tour Around Georgia

VALDOSTA, Ga., Nov. 23—The tour around Georgia, a semi-sociability, near-endurance run, of rather imposing size, all things considered, rolled placidly into Valdosta this afternoon.

Barring a Buick that was side-swiped and turned over by a passing motor car yesterday; and the Overland of B. R. Beck, of Eastman, which had sprung a carburetor complaint of mysterious character at Zebulon and was marooned there, every car of the thirty-seven now in the tour reached this place safely.

The 137 miles from Americus to Valdosta proved, with some exceptions which were trifling in extent but treacherous for all that, smooth—as smooth as a confidence man's talk, and as hard as his heart.

The start from Americus was without incident. So was the brief stop at Albany, where the scheme for the tour was launched. The town was decorated for the occasion and the tourists as they entered passed under an arch made of hay bales. There was a brief stop, and while it lasted there was much passing around of sandwiches on plates and the juice of Milwaukee in bottles. One exuberant newspaper correspondent wired back to his paper: "This town was the birthplace of the tour. It would have been the deathplace of some of us if we had stayed long."

Once torn away from Albany the tourists meandered on to Thomasville, the noon stop. There lunch was served by the Thomasville people in the Mitchell house. With this disposed of the afternoon hike began and was continued smoothly enough until after Quitman was passed. From there on the roads were sandy and swampy into Valdosta.

The start from Atlanta Wednesday was made at such an early hour and the air was so cool that only a moderate crowd turned out to see the getaway. The thirty competing cars and the three official cars started briskly. Incidentally, it may be mentioned that this body of thirty-three cars is only the nucleus and at every stop until Savannah is reached more machines will be added to the list. Two cars were picked up at Albany and two at Americus.

The amazing thing about the tour the first day was the excellence of the roads. Fully two-thirds of the day's running, 149 miles in all, was virtually perfect. The only really bad spot was encountered at Woolsey. There there was mud, not wide but deep.

The lunch stop was at Zebulon, and there on the public square a free barbecue was spread. It was a typical Georgia affair—one such as greeted the Gliddenites at Commerce, about a month ago.

From that point onward it was mostly good running to a point beyond Monte-

zuma, where Sumter county began. There the tourists were greeted with a sign: "Two hundred miles of the best road on earth. Let her go." From there on to Americus it was superlatively good. Unless one has ridden over a south Georgia sand clay road in dry weather its excellence can hardly be imagined. And over such roads the cars rolled into Americus, near which point they were met by forty welcoming motor parties.

Two of the cars in the tour are being handled by women. Mrs. Henry Meinert is driving a Maxwell and Miss Regina Rambo an Oakland. Both are competing for the Waycross cup, offered for the most expert woman driver.

No penalties were assessed the first day except against the Buick that turned over.

VAN DYKE COMPANY FAILS

Detroit, Mich., Nov. 27—The Van Dyke Motor Car Co., manufacturer of Van Dyke motor trucks, in this city, filed a voluntary petition in bankruptcy in the United States district court here this morning. The company's liabilities total \$143,090.02, while the assets are put in at \$90,329.85, including bills, promissory notes and securities valued at \$52,901.18 and machinery, tools and equipment valued at \$23,516.59. The plant at Leavitt street and Campbell avenue is closed down and the property is in the hands of the Security Trust Co., as receiver under involuntary proceedings in bankruptcy begun last week, by three creditors, on the strength of a report that the company had received an offer to sell. There is talk of a reorganization of the business, but no definite plan has been formulated as yet.

The explanation of the failure is simple. The company has been selling a \$1,500 car for \$900 or thereabouts, and, it is said, did not have the capital to carry the business along on this basis until economies in operation and other branches of the business could be effected to bring the cost down. There has been no lack of demand for the cars; on the other hand, they have been selling readily.

William Davies is president of the company and William Van Huse Moore, treasurer. The directors are the officers and Wilbur Brotherton, Detroit; Benjamin S. Dean, Jamestown, N. Y., and William W. Wuchter, Akron, O.

The Security Trust Co. will continue to act as receiver under the voluntary proceedings, which supersede the involuntary petition. The plant will ultimately be disposed of at receiver's sale, in all probability. The company was purchasing the land from the Lowrie & Robinson Lumber Co., on contract, and this is given a value of \$32,000 in the list of liabilities. Very little had been paid on the contract and the company's equity in it is of questionable value.

Findings of the A. A. A. Contest Board

NEW YORK, Nov. 24—The A. A. A. contest board has sustained the decision of the referee who disqualified Spencer Wishart in the Fairmount Park road race for losing his mechanic.

For promoting the unsanctioned race meeting at the Westchester Driving Club's ½-mile track at White Plains, N. Y., on election day, Edson Card, Jr., was indefinitely disqualified and suspended. Because of extenuating circumstances the penalty of disqualification provided by the rules for participation of registered drivers in unsanctioned contests was suspended in the cases of those drivers who had competed, as the board felt such drivers had participated in good faith and under the belief the meeting had been officially sanctioned.

Upon his own admission that he had knowingly participated in an unsanctioned hill-climb at Bedford, Ind., on October 10, last, Frank P. Fox, a registered racing driver of Indianapolis, who drove a Pope-Hartford car in the 500-mile event at the Indianapolis speedway on Decoration day, was disqualified and suspended for 1 year to and including October 10, 1912, and his driver's registration card No. 395 was revoked.

The formal application for reinstatement of H. D. Fisher, who was disqualified on July 18 for incompetent driving at Brighton Beach on July 3, last, was considered, but the board declined to reinstate him to good standing.

The second application for reinstatement of George H. Clark, driver of Cutting cars, who was disqualified and suspended December 20, 1910, for 2 years to January 1, 1913 for driving in the unsanctioned race meeting at Ascot Park, Los Angeles, assumed name of "E. Z. Martin," was considered. Clark's disqualification was on November 3, 1911, temporarily suspended pending action on his appeal, but the board in reviewing his case declined to reinstate him to good standing because of the seriousness of his offense in competing under a name other than his own.

OLD TIRE SUITS REVIVED

New York, Nov. 28—Special telegram—Orders issued by the United States circuit court in the suits of the Consolidated Rubber Tire Co. against Goodrich, Republic, and Morgan & Wright, based upon the alleged infringement of the Grant patent on solid tires, allow each of the three defendants 60 days in which to plead to the complaints.

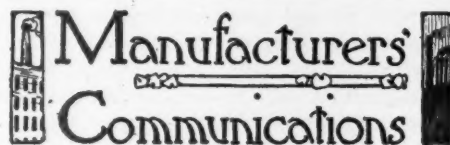
The suits were instituted about 2 years ago and have lain practically dormant pending a decision of the patent by the supreme court. This was handed down last spring and now the present suits will be determined. The complaining company alleged that the Grant patent was valid and belonged to it, and charged that the

defendants infringed it. Preliminary injunctions were issued and the cases will be tried upon their merits, probably at the spring term of court.

The plaintiff company seek permanent injunctions, an accounting with each defendant and damages.

MAINE'S GOVERNOR FRIENDLY

Augusta, Me., Nov. 25—Thousands of motorists in all parts of the country who motor through the Pine Tree state during the summer and fall months will be delighted to learn that Governor Plaistaid, of Maine, has become deeply interested in the subject of good roads, and has promised greatly improved road conditions. Governor Plaistaid made this announcement a few days ago to James Coggeshall,



NATIONAL CLAIMS RECORD

INDIANAPOLIS, Ind.—Editor Motor Age —In the Santa Monica road race Harvey Herrick established a new world's record of 74.63 miles an hour for 202 miles. Ralph Mulford in a Lozier in the Vanderbilt is reported to have traveled the same distance at the rate of 74.9 miles an hour, time being taken for him before the finish of the Vanderbilt. The National record was made over an 8.5 mile course and time was for the full distance of the race. The Lozier record was made on a course 17 miles in length.

In the case of the Savannah Vanderbilt race the average time has been taken at an intermediate distance and will not be officially recognized as a road race record because there is no provision in road race rules for the taking of record time at intermediate distances. In order to make an official road race it is necessary that the average time be taken for the full distance of the race and not for any intermediate distance. The National's record is considered phenomenal because of the fact that it was made on an 8½-mile course and because in making that record the old record of 74.3, made by Nazzaro on the Florio cup course in Italy, 30 miles in length, was broken at that time. A long course of 30 miles, such as the Italian circuit, as well as a course of 17 miles, such as the Savannah course, gives the contestant an advantage, because it has longer straightaways in which to make time. If this road race record claim is made for the Vanderbilt race, it will undoubtedly not be allowed. The National company claims that it still holds the world's road race record of 74.63 miles an hour.—National Motor Vehicle Co., George M. Dickson, general manager.

the New England traveling representative of the Velie Boston branch, when the latter met the governor at the Elks' Home in Augusta, Me., upon his return trip through the state.

"Tell me about the roads," requested the governor. "I am glad to learn from one who has experienced the conditions on such a long and thorough trip throughout the state. I realize what good roads mean to the thousands of motorists who tour the state. I am very anxious that road conditions shall be improved so that every motorist shall find the roads attractive for motoring. I want every motorist to know that I am interested in the good roads problem and shall do everything possible to bring about better conditions. You tell the motorists."

SHOW GOSSIP FROM NEW YORK

New York, Nov. 28—Special telegram—With seventy manufacturers of commercial vehicles and 138 parts and accessory makers signed up to show at Chicago, the prospects for truck week of the annual show present brilliant possibilities. It has been estimated that the use of commercial vehicles in Chicago territory has increased 35 per cent during the past year and the business element of the territory is much more intensely interested in motor trucks than it was formerly. Consequently, a larger patronage of the coming show is looked for than ever before in the history of the show.

The poster which will be used to advertise the Madison Square garden show of the Automobile Board of Trade has made its appearance. The subject is an oriental girl bedecked with eastern jewels and wings. She stands with arms outstretched, holding a passenger motor car in one hand and a business wagon in the other.

No progress was reported on the plans of the new show building which will be erected north of the present Grand Central palace. After they are completed it will be necessary to lay them before the New York Central for approval, and pending such approval the authorities decline to give out anything official.

ENGINEERS COMING HOME

New York, Nov. 28—Special telegram—Advices cabled from Paris by Coker F. Clarkson, secretary and general manager of the Society of Automobile Engineers, make the announcement that the delegation from the society that has been spending a month inspecting British and continental factories and engaging in scientific conferences will sail for New York on the steamer Olympic November 29. Mr. Clarkson says that the visit has been a great success in every way and that the foreign manufacturers have done everything possible to interest the visitors. Not all the party will return on the Olympic, as quite a number will remain abroad for several weeks longer to make more detailed inspections and to go into fields not touched by the regular itinerary.

Gasoline

WE recently saw correspondence between the owner of a car to the manufacturer of same, in which the owner asked if he would get better results if he used high-gravity gasoline. The reply was that he would, and he was recommended to purchase nothing but 74 gasoline, as it would produce more power and more heat units.

Now, we don't think the manufacturer intended to deceive his customer, and the most charitable view would be to assume that he was simply ignorant; but the user would naturally accept this advice as gospel truth, coming, as it did, from the man who made the car. The advice was bad, viewed from any standpoint. In the first place, the owner could not get 74-gravity gasoline in the section in which he lived, and if he could, the price would have been prohibitive; but, having obtained it, he would have suffered on account of lack of power. Nevertheless, he would be a dissatisfied man—dissatisfied with his car, and dissatisfied because he could not get what he thought he should have. It is this kind of ignorance and lack of co-operation that is hurting the car industry, and will injure it still more if not corrected.

Now, let's see how the motor car manufacturer can co-operate. He can first post himself thoroughly as to the facts, and convey these facts intelligently to the users of his car. He can put a self-starting device on all cars that he manufactures. A great many cars for 1912 are already so equipped, but this, of course, costs money, and adds materially to the cost of the car, and is not absolutely necessary. But it is a great convenience, and, viewed from this standpoint, the builders of gasoline cars can well afford to give this feature careful consideration, for with such a device, the gasoline car has every advantage over the electric, even for a woman; but in so far as starting a car is concerned, it is not a necessity.

A much cheaper and more effective device would be a primer; one that will inject a small quantity of gasoline into the manifold. This can be done in a number of ways. One method is to use a small pump, with hollow wire, leading from the gasoline supply pipe to the pump, and from the pump to the manifold. The pump can be placed on the dashboard or under the hood, the plunger rod being located at some convenient point.

A still cheaper plan is to place on the dash, a small reservoir, a gill is sufficient, in which gasoline can be stored. Beneath this a petcock should be placed, with hollow wire leading to the manifold. By opening the petcock for an instant when

By Petroleum

ARTICLE V

inserting the switch key, the driver can always be sure that the car will start on the first turn, provided, of course, everything else is in working order.

Either of these devices can be put on a car while it is being built at so small a cost—probably not to exceed \$2—that the item of expense would not be felt, even if absorbed by the manufacturer. It would add more to the convenience and efficiency than any other refinement.

Why every car does not go out so equipped we are unable to explain. Possibly it is because this feature has never been brought pointedly to the attention of the manufacturers. Even if such a device is not placed on the car when manufactured, the user can equip his own car at a cost of but a few dollars. How many cars are placed in winter storage simply from lack of such a convenience? Even if a car is equipped with a self-starter it should also have a primer, as described above. With such an arrangement, we would hear no more of the difficulty in cranking a car. The demand for a high-gravity gasoline would be a thing of the past; manufacturers, dealers and all concerned would be saved an endless amount of grief. So that, after all, the question of ease in starting a car does not rest with the designers of carbureters, or the refineries of gasoline, but with the motor car manufacturers.

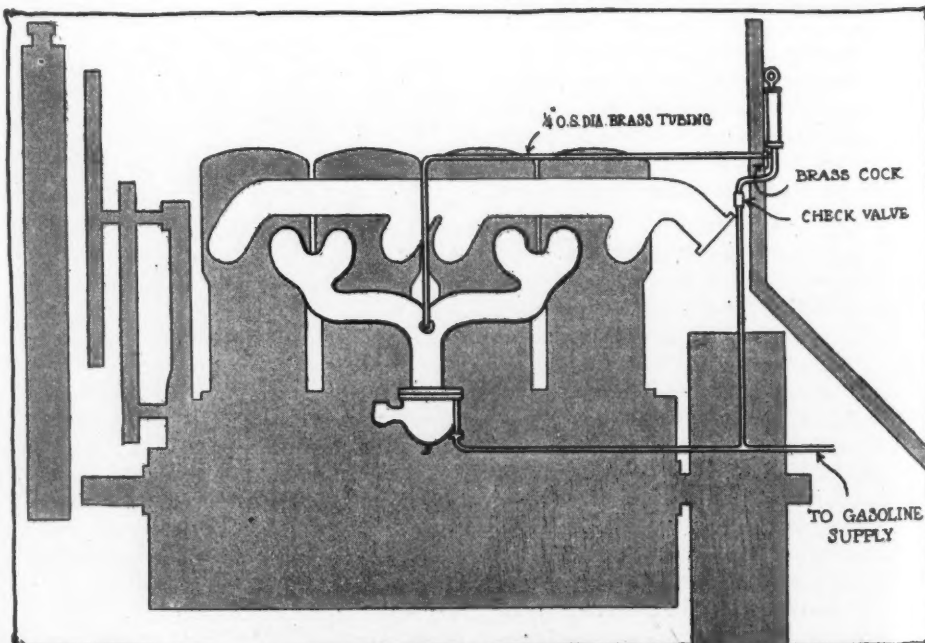
Are we not justified in insisting that some such device be on every car we buy in the future? It is worth more than all the waterjacketed carbureters or methods of heating the gasoline put together, and the cost is nil.

We hope this series of articles is impressing upon you a few facts that will be of benefit to every user of gasoline, and be the means of saving much grief, as well as many shekels.

We do not pretend in this series to have told everything that there is to know about gasoline. We don't know it ourselves, and we doubt if the man lives that does. There is much that future investigations will reveal that is yet a closed book to us all.

The facts, as given, are the result of a careful, thorough and painstaking investigation, and every statement that has been made has been carefully weighed, and is an absolutely true statement of the facts. We have not attempted to burden you with the tedious processes by which we have reached our conclusions, nor have we gone into detail. We have simply given you the short-cut result of these investigations, boiled down, so that "he who runs may read."

We have seen that gravity is no criterion as to quality; that a high-gravity Pennsylvania gasoline is no better than a low-gravity western gasoline, providing the boiling points are the same; on the contrary, the low gravity is better, because, being heavier, it produces more heat units; consequently, more power. We have learned that when a man talks high-gravity to us, he is either ignorant or he has an axe to grind, possibly both. We have learned that a gasoline to produce the best results in a motor must have low initial boiling points, gradually rising to high boiling points. But more than this,



CONNECTIONS FOR PRIMING A MOTOR

Method by which gasoline may be injected into manifold by means of a plunger pump located on the dash

we have seen the necessity of preserving and conserving this supply of nature, and making it go as far as possible, both that we may have an abundant supply for the future, and that the price will not be so high as to be prohibitive. We surely know what we want and how to get it. A word to the wise is sufficient.

68 TON MILES PER GALLON

London, Nov. 15.—The great performance put up by the 40-50 Rolls-Royce car during its recent R. A. C. observer run, London to Edinburgh, in which it achieved a record of fuel consumption of 24.3 miles per gallon, or 57.07 ton miles per gallon, has just been eclipsed by a second R. A. C. test for the same route in connection with a 13.96 Delahaye car fitted with the Thomas electric transmission system. During this test the average speed maintained was 19 miles per hour and the gasoline consumption the double journey was 22.236 gallons, which gives a rate of consumption of 1 gallon for every 35.73 miles, or 67.92 ton miles per gallon. The engine had a bore of 75 millimeters by 110 stroke, and the total weight was 4,258 pounds, of which 224 pounds was dead load. The average weight of the live load was 815 pounds. The consumption of lubricating oil also was very creditable, being at the rate of 1.417.35 miles per gallon. Throughout the trial the engine was started by means of the electric system, and the current was also used for lighting the lamps.

Another record worthy of note has just been achieved by the new 11.9-horsepower Arrol Johnston car, which in a 6 hours' run at Brooklands averaged 50.2 miles per hour. The bore of this engine is 69 millimeters by 120 stroke.

REPORT ON ITALIAN BUSINESS

Washington, D. C., Nov. 25.—A report made to the United States government through the Daily Consular and Trades Report shows that the value of motor cars and motor accessories exported from Turin to the United States during 1910 was \$295,013, as against \$674,666 in 1909. It is the consulate's belief that the year 1910 will hereafter appear as having marked a turn of tide, and that European motor cars will in the future, on account of the formidable and increasing competition that they have met and must continue to meet from American manufacturers, be exported to the United States in steadily decreasing numbers. The decrease can be explained in no other satisfactory way. It occurred in a year when the production of cars in this consular district and in Italy in general proved greater than ever before; when conditions in the district and throughout Italy were especially favorable to car builders; and when, for the first time, American cars and accessories entered Italian markets under markedly favorable conditions. The fact that the most important company in Turin and Italy, and one of the most important in Europe, opened large

The Motorists' Bookman

Marie Corelli's Latest Book

IN "The Life Everlasting" Marie Corelli has given in graphic style the substance of her belief in theosophy or reincarnation, which she definitely outlines in a prologue of thirty-five pages. The story is that of the crucible necessary to pass through in order to reach the lofty pinnacle of mastery of one's self and nature by which the culmination of all one's desires may be had at command. The George H. Doran Co., New York, is the publisher.

European Motor Trip

"A Motor Tour Through France and England," by Elizabeth Yardley, is a diary record of 21½ days' sightseeing by motor in France and the British Isles. It is a decidedly stereotyped account of a hurried trip, and gives one a sense of being whirled through the country in a sight-seeing car with its conductor describing in the most mechanical, matter-of-fact fashion the points of interest. The tour began at Paris, going to Tours, thence along the Loire to Nantes; up the coast of Brittany, thence Paris by way of Rome. London is the starting point in England, with York as the northern objective point, thence Leeds and Liverpool, dipping into Wales, then returning to London. James Pott & Co., New York. Price, \$1.50.

The Land of Windmills

"The Spell of Holland" lives up to its title, for as one reads the delightfully-told description of this quaint country it seems to bring it so familiarly to the reader that one feels a sense of being acquainted with all its quaintness and

picturesque beauty. To the motorist who may be planning a foreign tour and wants to know more of the land of the dykes and windmills, this book will appeal, and for those who do not entertain any such hope, it will help them to appreciate the home life of the people. It is not a guide book, but just an entertaining account of the personal experiences of interested travelers. The illustrations, of which there are many, make the book in its entirety one of value to the motoring fraternity. Burton E. Stevenson. Published by L. C. Page & Co.

With Delhi and its Royal Durbar in the limelight, motorists will be interested in knowing how it is possible to motor to the royal ceremonies. The Dunlop Motorists' Guide, issued by the Dunlop Pneumatic Tire Co., London, has issued a booklet outlining a route from Bombay to Delhi, after shipping the car from England to Bombay. The motor route covers 1,000 miles, divided into an 8-day tour ranging from 73 to 133 miles per day. Outline maps of each day's run show the dak bungalows where food can be obtained, and the inspection bungalows, which are for sleeping accommodations only. Much valuable information as to the necessary equipment for such a trip is given, and the road conditions and accommodations are briefly outlined. His highness, the marajah of Gwalior, is an enthusiastic motorist and has looked after the comfort of visiting motorists in the way of gasoline stations, etc. The book can be secured upon request from the tire company.

works in the United States during the year had nothing to do with the decrease, the latter works not being in operation during 1910. The consulate's estimate covering motor cars built in Turin during 1910 sets the number at 3,907, as against the estimate of 3,700 for 1909, and it is estimated that during 1910 only 560 cars were built in Italy outside of Piedmont.

Market conditions, on the whole, were good, and the demand for Turin cars, especially for cars of medium power, was satisfactory and uniform. The market was enlivened during the year by unexpectedly large orders from Argentina, Brazil and Mexico.

STRANG'S HEIRS WILL SUE

Racine, Wis., Nov. 24.—Suit for \$10,000 damages for the death of Lewis Putnam Strang, the racing driver, who met his death in an accident during the 1911 Wisconsin reliability tour while driving the technical committee's official car, a Case, will be instituted at once by C. H. Bash-

ford, cashier of the First National Bank of Lancaster, Wis., who was appointed administrator of the Strang estate 2 weeks ago.

The accident occurred near Blue River, in the town of Wattertown, Grant county, Wis. In passing along a private turnpike or toll road Strang, to pass a team of horses, drew to the edge of the road, which crumbled away and precipitated the car to the ditch below, a distance of 10 or more feet. Three passengers in the car, including Joe Jagersburger of the Case racing team, who recently was injured at Columbia, S. C., were unhurt. Strang was instantly killed, the heavy car crushing his skull.

The Union Bridge Co., owner of the toll road, is charged with negligence in failing to provide adequate protection to the road and with neglecting to keep the highway in proper repair. The suit will be in behalf of three sisters of Strang, who reside in Brooklyn, N. Y., and are his only living relatives.

DECRIES HIGH PARTS COST

Owner Thinks Makers Have Short-Sighted Service Policy

OIL CITY, PA.—Editor Motor Age—I have read with a great deal of interest the editorial in a recent issue regarding the unbusinesslike and unjust methods of motor car manufacturers in making excessive charges for extra parts and, with many others, wish to corroborate the statements in Motor Age and urge a continuance of the editorials on the subject.

Up to the present time the business was called the "motor car game"; in fact, it was referred to as such by the manufacturers themselves and only those who had all kinds of money and did not care how they blew it were supposed to play the game and, in fact, the business was limited to that class; but lately, with the introduction of the many medium-priced cars, the use of motor cars is becoming quite general and would become more so if it were not for the constant complaint of owners about upkeep, the large part of which is for extra parts.

From a business standpoint it would seem that the policy of the wise manufacturers—and there must be some wise ones in the business—would be to make the use of the motor car as economical as possible instead of trying to make it as expensive as possible. When trying to sell a car the agent will tell you what a grand business organization there is back of that particular car and how well the buyers are treated in the matter of extra parts; but after the sale has been made their entire aim from that time seems to be to see how soon they can bankrupt the buyer. After I bought my first car and had occasion to buy extra parts I thought I was the only one being stung, and that when I bought another car I would consider the business methods of the maker as much as the quality of the car and try to keep away from dishonorable and unbusinesslike concerns. Since this time I have had three different makes and I am sorry to have to state that I find them all alike, and upon talking to my friends find



they all have the same complaint about factory treatment.

Right in my own neighborhood there are represented seven of the leading and highest-priced cars on the market and, while all of these cars have given excellent satisfaction, there is not one owner who would recommend to a friend the purchase of any one of them. I have a large seven-passenger car which has given entire satisfaction but I would go out of my way to prevent a friend from buying one. All this discontent on the part of the owners is due to the exorbitant price of extra parts and delay in furnishing them. We all expect to pay a little more than a reasonable profit, but when an owner is charged \$4 for a valve which actually costs 7 to 8 cents to make, or is charged \$8 for a gear that can be bought elsewhere for \$3, or \$5 for a brake shoe that costs 50 cents, it is no wonder that owners are complaining.

My car cost me \$4,000, but on the basis I am charged for extra parts the car would cost about \$10,000 to rebuild. Owners are getting wise and I find that most of them are buying parts from machine shops and supply houses where, in many cases, better material and workmanship is furnished and at much lower cost than through the factory. Manufacturers have told me that the furnishing of new parts was more profitable than building new cars, so if such is the case it would seem very shortsighted policy on the part of the manufacturers not to nurse this business instead of fast killing it as they are now doing.—Owner.

OSWALD MADE IN GOSHEN

Port Washington, Wis.—Editor Motor Age—Through the Readers' Clearing House will Motor Age tell me where the Oswald motor is made, by whom made, and how much power the motor has? It is a T-head

The Readers'

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

and has a 5-inch stroke and a 3¾-inch bore.—A Reader.

The Oswald motor is made by the Oswald Motor Co., Goshen, Ind. The bore of 3¾ inches gives it an S. A. E. rating of 22.5 horsepower.

ADJUSTING SCHEBLER CARBURETER

Webb City, Mo.—Editor Motor Age—Kindly tell me through the Readers' Clearing House how to adjust a model L Schebler carbureter.—Enos Currey.

Before adjusting the carbureter make sure that your ignition is properly timed, and that you have a good hot spark at each plug; that your valves are properly timed and seated, and that all connections are tight, and that there are no air leaks of any kind in these connections.

In adjusting the carbureter, first make your adjustments on the auxiliary air valve A, so that it seats firmly but lightly at T; then close your needle valve by turning the adjustment screw B to the right until it stops. Do not use any pressure on this adjustment screw after it meets with resistance. Then turn it to the left about a turn and a half and prime or flush the carbureter by pulling up the priming lever C and holding it up for about five seconds. Next, open your throttle about one-third, and start the motor; then close your throttle slightly and retard your spark and adjust throttle lever screw F and needle valve adjusting screw B, so that the motor runs at the desired speed and hits on all cylinders.

After getting a good adjustment with your motor running idle, do not touch your needle valve adjustment again, but make your intermediate and high-speed adjustment on the dials D and E. Adjust pointer on the first dial D, from figure No. 1 toward figure No. 3, about half way between. Advance your spark and open throttle so that the roller on the track running below the dials is in line with the first dial. If the motor backfires with the throttle in this position, and the spark advanced, turn the indicator a little more toward figure No. 3; or if the mixture is too rich, turn the indicator back or toward figure No. 1 until you are satisfied that your motor is running properly with the throttle in this position, or at

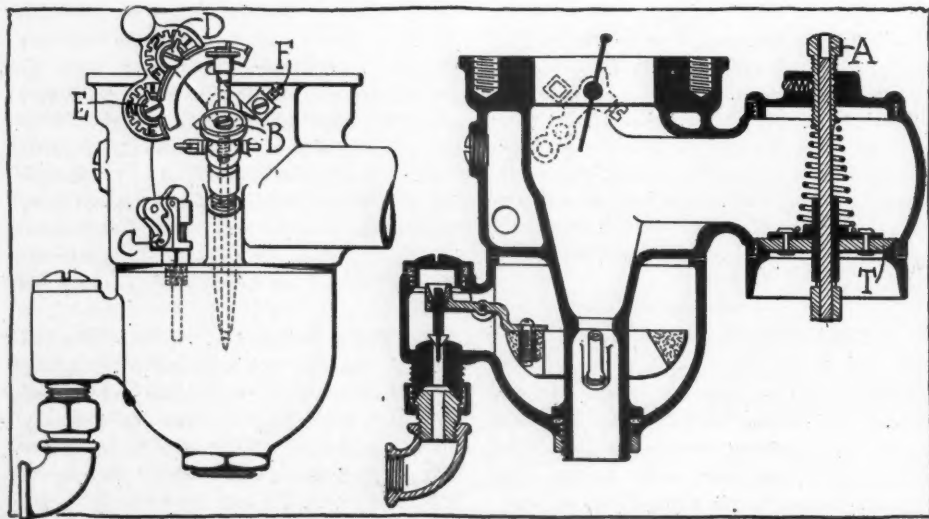


FIG. 1—ADJUSTMENTS OF SCHEBLER MODEL L CARBURETER

Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

intermediate speed. Now, open the throttle wide and make your adjustment on your dial E for high speed in the same manner as you have made your adjustments for intermediate speed on dial D.

It is found that in the majority of cases in adjusting this carbureter the tendency is to give too rich a mixture. It is suggested and recommended in adjusting the carbureter, both at low, intermediate and high speed, that you cut down the gasoline until the motor begins to backfire, and then increase the supply of fuel, a notch at a time, until the motor hits evenly on all cylinders. Do not increase the supply of gasoline by turning the needle valve adjusting screw more than a notch at a time, in your low-speed adjustment, and do not turn it any after your motor hits regularly on all cylinders. In making the adjustments on the intermediate and high speed dials, do not turn the pointers more than one-half way at a time between the graduated divisions or marks shown on the dials. By following these instructions the adjustment should be satisfactory.

AUXILIARY AIR INTAKE

Cincinnati, O.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—How can I keep an even pressure in my gasoline tanks? I have a small tank forward of the carbureter and a large one back of the seats, with a hand air-pump connected to the large tank. Will I have to have a check valve between the two? Will it be possible to use the same carbureter for pressure feed that I used when equipped for gravity feed?

2—Has the Thomas car ever been entered in a Vanderbilt race? If so, which ones and who drove them?

3—Would it be advisable for me to put a small air valve in my intake manifold, between the carbureter and the cylinders?—Penn.

1—You will need a check or float valve between the two tanks, but the same carbureter can probably be used for either pressure or gravity feed. The arrangement will depend upon the present arrangement of the tanks and Motor Age suggests that you send in a sketch showing the fuel system you have at present. More

definite information can then be supplied.

2—In the 1906 Vanderbilt, won by Wagner, in a Darraq, Le Blon, in a Thomas, led all the American cars. There were two other Thomas cars entered, one driven by Coulois, and the other by Montague Roberts. In the 1908 Vanderbilt, Salzman, in a Thomas, ran fifth; Seymour, ninth, and Gill, sixteenth; both in Thomas cars.

3—Yes; an arrangement such as that shown in Fig. 2 has been found to be satisfactory. A hole is cut in the intake manifold and a cover hinged at A, operated by a rod D to the dash and attached to the cover by a pin at B. At C is shown the throttle control rod. Another arrangement is that suggested by a reader and illustrated in Fig. 3.

REMOVING PREJUDICE

Homewood, Miss.—Editor Motor Age: Unfortunately for a majority of the southern farmers, they have an unreasonable prejudice against the motor car, and for that reason we are having a hard time getting them in line on the good roads movement. I am a good roads advocate and an owner of a car, and pastor of four strong country churches. At one of those churches we were rebuilding—building a new church house, the work being done by the farmers and members of that church. The job of elevating the shingles for the covering was the smutty job of the whole building. They had pulled at ropes until their hands were blistered. I had a Sears car, model K, but had never ridden to church in it on account of this prejudice. But I ventured down to the new church building, backed my car up near the building, jacked up the rear wheels, tied a rope to the drum of the wheel and elevated the shingles with the car. From that day to this everything has been smiles over my car.—W. W. Graves, Pastor Methodist Episcopal Church, South.

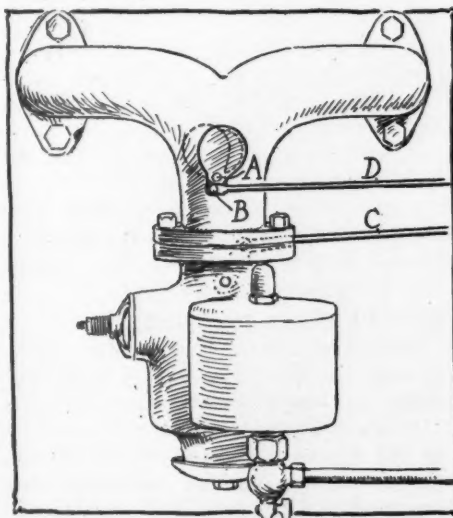


FIG. 2—EXTRA AIR INTAKE

AN EXTRA AIR INTAKE Reader Describes Auxiliary Inlet in the Gas Manifold

Collinwood, O.—Editor Motor Age: As a reader of these columns I would like to say a few words on carburation. From tests conducted on several well-known makes of cars I am strongly in favor of an air intake valve on the inlet manifold above the carbureter to be used for high speeds. If possible to get in a position to watch the auxiliary air intake to your carbureter while running on the road, it will be found that the valve is open to the limit at about three-quarter throttle. This seems to show that the motor would take more air if it could get it. I use a valve similar to the accompanying illustration, Fig. 1, connected to a lever on the dash. This valve is air-tight when closed and can be opened about $\frac{3}{4}$ -inch.

After a little experience the driver can tell at what throttle position to begin opening the air valve and he will be surprised at how far he can open the valve before the motor will misfire at high speeds. Another use for this valve, besides serving as a power increaser, is to cool the cylinders on descending grades.

On reaching the top of a descent I always turn off the switch, close the throttle, open the air valve wide, and if the hill is steep change into the lower gear. This clears the cylinders of all the burnt gases and the cool air cleans the valves and plug points. I would strongly recommend this way of running, especially in hilly country, as it not only prevents the motor from overheating, but saves brakes. In fact, I have taken long trips without using any brakes at all to speak of and it is a comfort to feel that one has two brakes to rely upon in case of emergency.—Thomas A. Seymour.

DRY BATTERIES NOT FOR LIGHTS

Canandaigua, N. Y.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—I desire to light 3-candlepower 6-

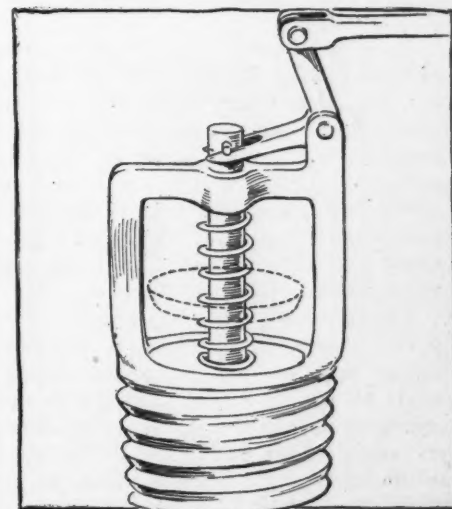


FIG. 3—SEYMOUR'S EXTRA AIR VALVE

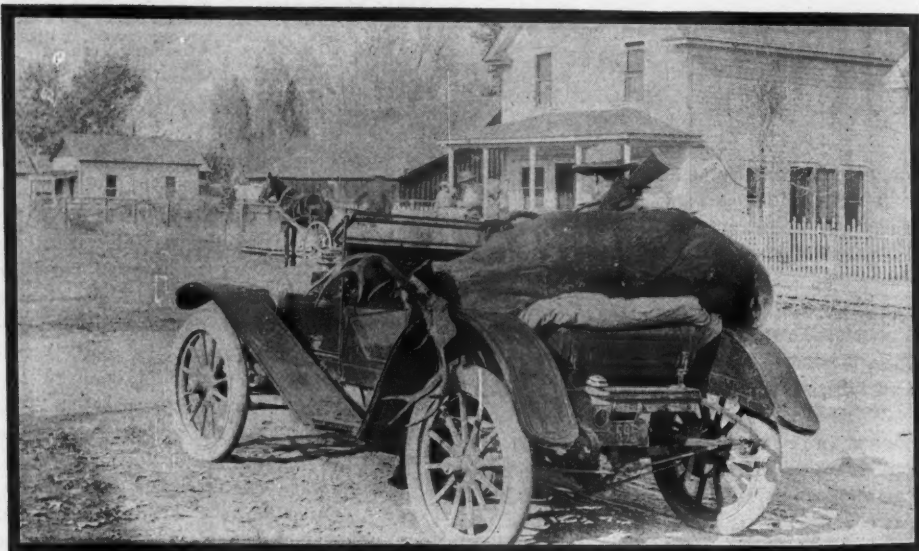


FIG. 3—MOTOR CAR AS HUNTSMAN'S MOUNT

volt lamps. Can I do this successfully with dry batteries?

2—How many dry cells should I use to get 6 volts and how long would they light 3-candlepower 6-volt lamps—F. M. Groschner.

1—Dry batteries can be used for lighting small electric lamps, but the life of the batteries is very short and they have to be renewed quite often. Dry batteries are intended for intermittent service rather than the constant drain of energy imposed on them when supplying lamps. It would be cheaper in the long run to get a lighting storage battery.

2—Five dry cells connected in series will light two of these lamps for a short time. A 40-ampere-hour lighting storage battery will light these two lamps for 35 hours without recharging.

WANTS TO BE MOTOR SALESMAN

Dubuque, Ia.—Editor Motor Age—Would Motor Age kindly advise what book would be advisable to learn motor car salesmanship for both local sales and for distributing among agents? I have had some experience in driving, but would like to get an idea of the finer details, in order to successfully handle prospective buyers.—G. E. Allen.

Motor Age knows of no book dealing in particular with motor car salesmanship, but the same general principles are required in the selling of cars as in any other commodity. There are a number of books on the market giving the principles of salesmanship, one of which is Practical Salesmanship, by N. C. Fowler, Jr., published by Little, Brown & Co., Boston, Mass. Of books on the motor car, there is a great variety. Probably those dealing on the general construction of the cars rather than on the theoretical design would be what you need. One giving the general characteristics of the various types of cars is called Self-Propelled Vehicles, by Homan, and published by Theo. Audel & Co., New York.

If you desire to go into all phases of

the motor car, including the design, construction, types, operation, etc., probably the best work for your purpose would be one of the libraries put out by the correspondence schools which have courses in motor car engineering. These usually are made up of a collection of the text books used in the correspondence course and are designed to cover the entire field. One of the latter is that published by the American School of Correspondence, Chicago.

ALCOHOL FOR COOLING

Concord, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—Which kind of alcohol is best suited for cooling systems on cars where there is not much rubber connections, or is not any other thing used but water to cool? Is denatured alcohol as good as wood alcohol, and what would be the difference between the two?

2—How much should be used of each, using it and water only?

3—Will alcohol and water freeze if the right amount is used in the first place and the engine stands for quite a while or is run every day? I would think that the alcohol might evaporate and leave the mixture weak. Would it be advisable to add more alcohol without adding water?—Howard Zahn.

1—Denatured alcohol is as good as any, and is cheaper than the other.

2—Use from one-third to one-half denatured alcohol or wood alcohol.

3—The alcohol evaporates much more rapidly than does the water, consequently, alcohol must be added from time to time, even if no water is added.

SEAT CONTROL OF LIGHTS

Baltimore, Md.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—What is the manufacturer's address of the device used on the 1912 Pierce-Arrow cars for igniting and controlling the headlights?

2—Is it thoroughly efficient and reliable?

3—Is it advisable to allow acetylene gas to burn low? Does this not cause the burner to corrode?—A Subscriber.

1—This system is known as the Auto-Flasher, and is made by the Motor Specialty Co., Boston, Mass.

2—Motor Age has not made a test of the device, but the fact that it is fitted on the car you mention as regular equipment should be of assistance in determining its value.

3—With some burners there is a tendency to corrode when the lights are burning low, but usually the infrequent replacements necessitated by turning down the gas are less costly than the gas consumed if turned full on.

INTERESTED IN BRITISH MOTORING

Chattanooga, Tenn.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—What is the name and address of a good English motor car magazine?

2—Is there an agent in this country for the English Daimler? If so, does he sell the B. S. A. car described in Motor Age issue November 16?

3—At what prices do the E-M-F and Overland, \$900 model, sell in England?

4—What other American cars are going to use the Knight engine besides the Stearns, Columbia and Stoddard-Dayton six?—Edward R. Richmond.

1—Among the leading English motor periodicals are the Car, 168 Piccadilly, London, W.; Motor, 7-15 Rosebery Ave., London, E. C.; Autocar, 20 Tudor St., London

2—No.

3—The Overland is listed at approximately \$1,090. The E-M-F at \$1,225.

5—No announcements have been made thus far.

AROUSED ENTHUSIASM

Baker, Ore.—Editor Motor Age—I enclose snapshot, Fig. 3, taken by my wife, on return from a day's outing recently. Half a dozen who gathered around the car as we came in town declared that they were going to have a motor car at once.—J. S. Dyke.

CARBURETER TROUBLE CAUSE

Pittsburg, Pa.—Editor Motor Age—I am having a very annoying trouble with a 6-48 car of the latest and highest type. This trouble only happens occasionally, and in both hot and cold weather, though more often in hot than in cold. This trouble, I think, is caused by the carbureter. Upon trying to start the motor after it has been in use the motor fails to do so readily except under these conditions: I must either jam down the air valve to its full limit or drain the gasoline entirely out of the carbureter. Sometimes with the air valve jammed open to its full limit, it will start the car readily, then, again, I will have to drain the gasoline out of the carbureter as well. The air valve opens automatically about 1/16 inch when the car is operating properly. When forced down to its full limit

it is open about $\frac{3}{8}$ of an inch. What causes the float in the carbureter to let in more gas in the mixing chamber one time than it does in another? This trouble is evidently caused by too much gasoline in the mixing chamber, but how can I prevent it?—O. V.

As you suggest, the trouble is evidently due to flooding in the carbureter. This defect is caused by improper adjustment of the carbureter, and had you given us the make and model of the carbureter we probably could have told you just how to remedy it. However, practically all carbureters have a means of adjusting the gasoline level, and you should adjust this at a somewhat lower level than you are using at present. Further, most carbureters have both a high-speed and low-speed adjustment for the air intake. It would seem that your low-speed air adjustment is set too tight, that is, not sufficient air is given to the mixture at low speeds. This can be remedied by the proper adjustments.

If the difference in gasoline level is found to be very great, with the motor running at ordinary speeds, it may be due to the float becoming gasoline logged. If a cork float is used it may have soaked up enough gasoline from the carbureter to make it slow acting; or, if a copper float, it may have a small leak in it which has allowed the liquid to enter. The float valve may be worn or roughened so as to not completely close the gasoline inlet. The trouble seems to be entirely in the carbureter, and a thorough overhauling and adjustment on it would seem necessary.

If, with the carbureter in first-class order, it is found that it is necessary to jam the air valve down to start, the best plan would be to install an extra air inlet which may be opened and closed as desired.

MAGNETO SET TOO LATE

Philadelphia, Pa.—Editor Motor Age—I take Motor Age regularly and gain much information from it. Now I am having some trouble, and wish Motor Age would tell me what is the cause of it, and give me a remedy.

I have a D U 4, model 5, high-tension Bosch magneto. I have the motor on a stand. The magneto is timed to fire 1-3-4-2 in rotation, when the flywheel is $\frac{3}{4}$ inch over the center, with spark retarded. I can crank all right and the motor will not start with the spark retarded. Advance the spark and one out of ten it will start; the other nine it goes back, that is, on a one-quarter turn of crank. When I spin the motor, it won't start with the spark retarded. With the spark advanced it always goes back. It will not start unless it is advanced all the way. So far as I can see there is nothing the matter with the magneto. The gears are set for a right-hand magneto and the armature is all right. I can turn it by hand and get a good spark in the safety gap, retarded or advanced. After putting another magneto

on the motor worked fine, never a miss on high or low. When I do get the bad magneto started it runs nicely on high or low speed, advanced or retarded. Can Motor Age tell me what is the cause of the trouble?—J. P. Sherman, Jr.

It would seem from your description of the trouble that the armature of the magneto is set too late. If the armature is set so that the dimensions E, Fig. 5, is from $\frac{1}{2}$ to $\frac{5}{8}$ of an inch, the setting is correct so far as the armature is concerned. If this does not remedy the difficulty, Motor Age may be able to help you more upon the receipt of further details.

PIERCE-RACINE REAR AXLE

Mendota, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age state who were the makers of the rear axle used on the 1909 Pierce-Racine touring car? This car is not made any more and I would appreciate this information.—C. Cummings.

These axles were made by A. O. Smith, Milwaukee, Wis.

CASE OF DIFFICULT STARTING

Washington Court House, Ohio—Editor Motor Age—I have a 1911 model 25 Elmore equipped with the Atwater Kent system, and run by a National Carbon battery, No. 266, no magneto. Have always had some little trouble in starting the car when it has stood long enough to cool; but when once started it gives no trouble at all. Some 2-months ago the starting trouble kept getting worse, we were then touring in western New York, and thinking perhaps the battery was getting weak, we put on a new one of same make and number. When the engine has been running and is warm, a little turn of the engine will start it, but if cool it requires two. Sometimes while one turns over the engine a few times, the other holds the hand over the air opening of the carbureter, and suddenly removing the hand, the engine starts. Other times, while one whirls the crank the other keeps lightly tapping the starting button on the Atwater Kent system, and after a while it starts. Usually it requires a combination of both methods mentioned. Have

traced the wiring from battery to box, and from box to cylinders, and can find nothing wrong. Have replaced some of the spark plugs with no advantage. One can whirl the crank—turn the engine over—until one is tired, and the engine will not start until the starting button is touched; and without whirling the crank, one can touch the starting button a week and it will not start. The carbureter is a Schebler, model D, I think. Will Motor Age advise me as to the trouble and a remedy?—J. L. G.

So far as may be judged from your description of the trouble, it seems probable that it is due to lack of adjustment at two places. The chief of these is that the carbureter should be adjusted to give a richer mixture at low speed, or else you are getting a grade of gasoline that does not evaporate as readily as it should. The contact screw H, Fig. 6, of the Atwater-Kent distributor probably needs adjustment to compensate for wear of the platinum points. Turn this screw about one-half turn to the right, or until the distance between the points is about $\frac{1}{64}$ inch for fresh batteries, or $\frac{1}{100}$ of an inch for weak batteries. This should be looked after every 1,000 miles or so.

QUESTION OF VALVE TYPES

Pensacola, Fla.—Editor Motor Age—Which is the quietest, best motor—the CID rotary valve, or the poppet valve motor in the Silent Knight?—Reader.

2—Will the Nicola Tesla motor supplant either of above mentioned motors?

1—Both the rotary valve and the sliding sleeve valve type of motors are quieter than the poppet valve type. So far as the silence of the operation is concerned there is little choice between the rotary valve and the sliding valve. A great deal of experimental work is being done upon motors of both the rotary and sleeve valve types and it is possible that a design will be developed which will be still more silent than the present constructions.

2—It is impossible to prophesy as to the future of the Tesla motor, but it is improbable that it will supplant the above types.

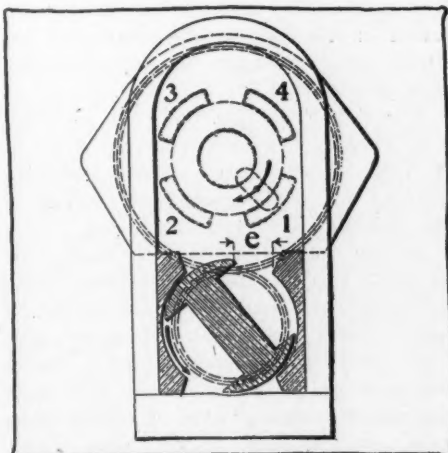


FIG. 5—SETTING OF BOSCH MAGNETO

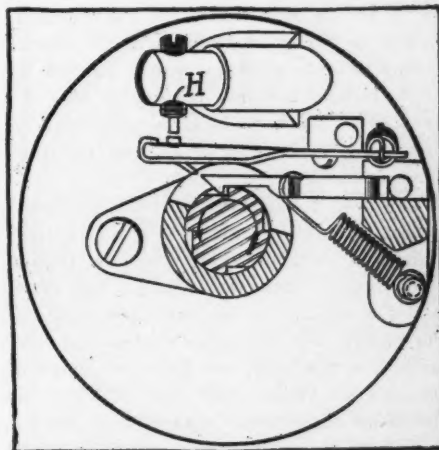
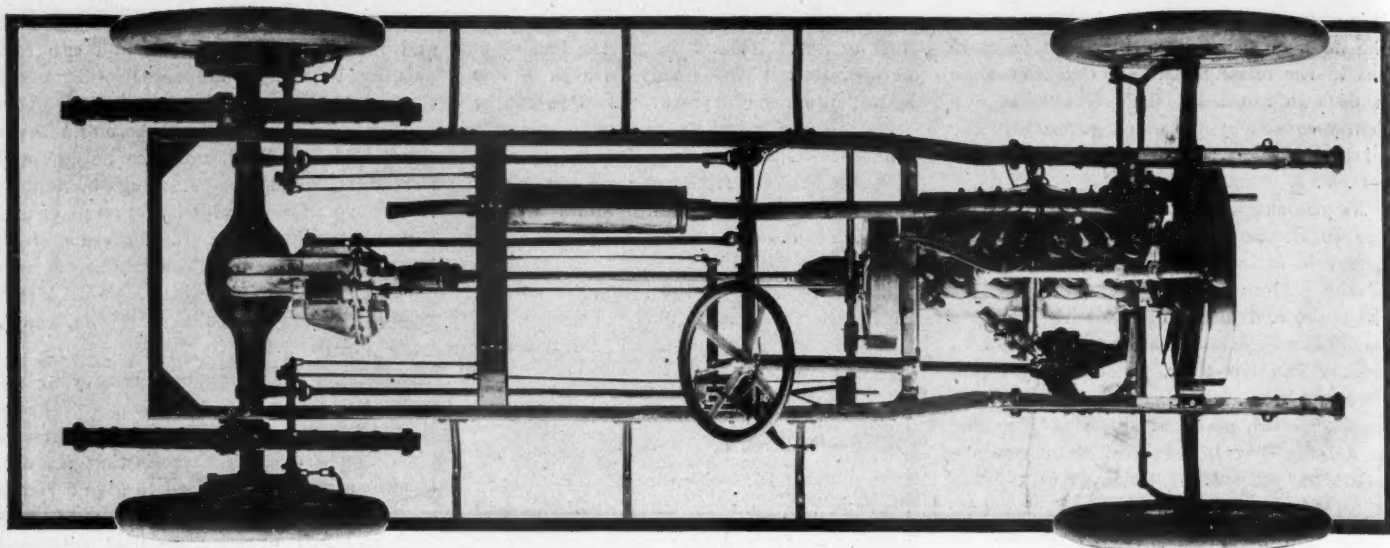
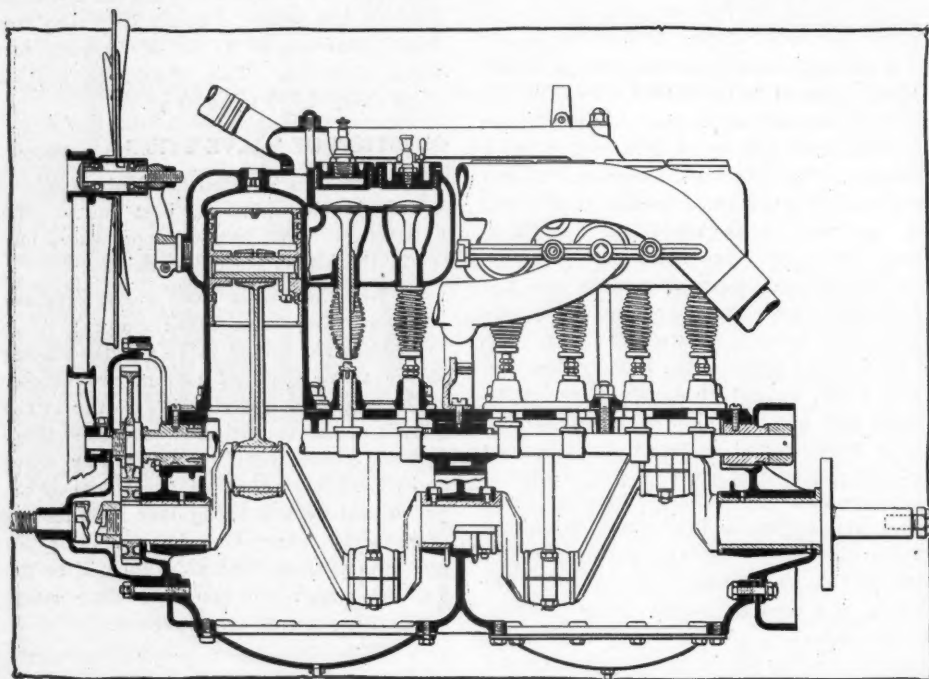


FIG. 6—ATWATER KENT MECHANISM



PLAN VIEW OF CHASSIS OF E-M-F FOR 1912

E-M-F and Flanders Chassis Changes



PART SECTION OF MOTOR OF E-M-F

THE E-M-F 30 and Flanders 20 cars made in the Studebaker Corporation's E-M-F factories at Detroit, Mich., exhibit a few notable changes which, though not of a radical nature, no doubt will add greatly to their general appearance, improve their riding qualities and facilitate their operation.

The new E-M-F cars have a drop frame, longer wheelbase, improved spring suspension and demountable rims as regular equipment. The gear shifting and emergency brake levers are arranged inside of the body; and the brake control rods and levers, at the rear, are brought inside of the chassis frame, and their design and operation improved. Spark and throttle levers are located over the steering wheel and operate on a stationary quadrant; an

extra adjustment is provided in the steering mechanism; and ventilators are provided in the dash for the comfort of the front seat passengers in warm weather.

Features of E-M-F

The E-M-F 30 line for 1912 comprises four body types, all of which are fitted to a single chassis design. These include a touring car, demi-tonneau and roadster of the fore-door design, and a coupe.

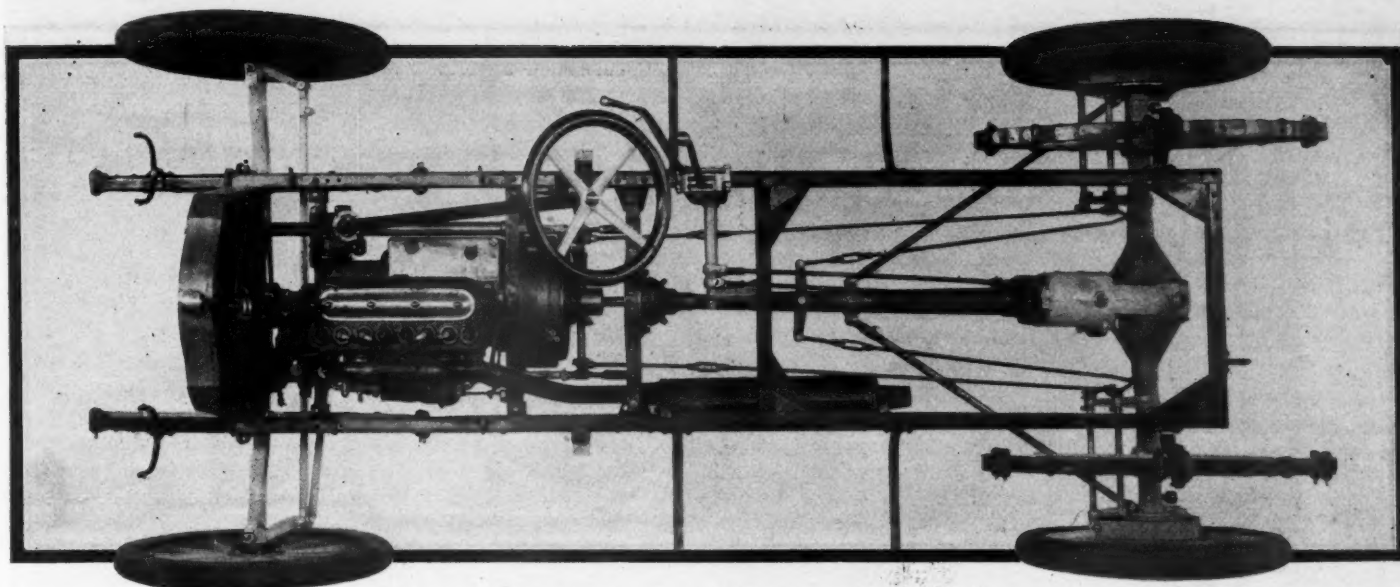
As for the chassis, it includes a four-cylinder, vertical, water-cooled motor with a 4-inch bore and a 4½-inch stroke, a leather-faced cone clutch, a long propeller shaft with two universal joints, a sliding selective gearset arranged in unit with the semi-floating rear axle, an I-beam front axle, pressed steel frame, semi-elliptic front and scroll elliptic rear springs, and

wheel equipped with 32 by 3½-inch tires. The wheelbase is 112 inches and the tread standard.

Details of E-M-F motor

The constructional details of the E-M-F motor are quite clearly shown in the diagram. The cylinders are of L-type design, cast in pairs, with integral valve chambers and waterjackets. These cylinders are mounted on a barrel type of cast aluminum crankcase, into which the drop-forged crankshaft is inserted from the rear end. This case is supported at each end in a flexible manner by two deep pressed steel cross members of the main frame. The end-plates of the crankcase contain the main bearings of the crankshaft, and the central crankshaft bearing is supported in the partition that divides the crankchamber into two splash compartments. This partition is to prevent the lubricating oil of the engine from collecting in one end of the case in ascending or descending hills.

The pistons are 5 inches long and fitted with four eccentric compression rings, three of which are arranged above the piston pin and one below it; piston pins are of case-hardened steel, drilled hollow to insure thorough lubrication and ground to size. Each piston also is ground to size and each set is carefully weighed to insure the perfect balance necessary to a smooth running motor. To increase the power efficiency and obtain minimum wear of the cylinder walls and pistons, the crankshaft, which is a steel drop forging, is offset ¾ of an inch from the center line of the cylinders. Camshaft and connecting rods also are steel drop forgings; the cams of the camshaft being forged integral with the shaft. The crankshaft bearings are of a special babbitt metal; phosphor bronze bushings support the camshaft and piston pins; and the lower ends of the connecting rods are lined with split



CHASSIS OF 1912 FLANDERS 20

Greater Accessibility Is Now Provided

bushings of die-cast babbitt metal. Shims are provided for the adjustment of the connecting-rod bearings; and large removable pressed steel hand-hole plates at the bottom of the crankcase give easy access to these bearings.

The valves employed in this motor are $2\frac{1}{8}$ inches in diameter and the seats and stems of the valves are ground to size. Removable valve guides which are pressed into place are provided; these may be replaced when worn. Careful consideration for the size of the inlet and exhaust valve ports seems to have been given, as they are large and unobstructed. Valve lifters of the simple mushroom type are employed; and adjustments are provided to regulate the clearance between the ends of the lifters and valve-stems for the purpose of maintaining noiseless operation of the motor.

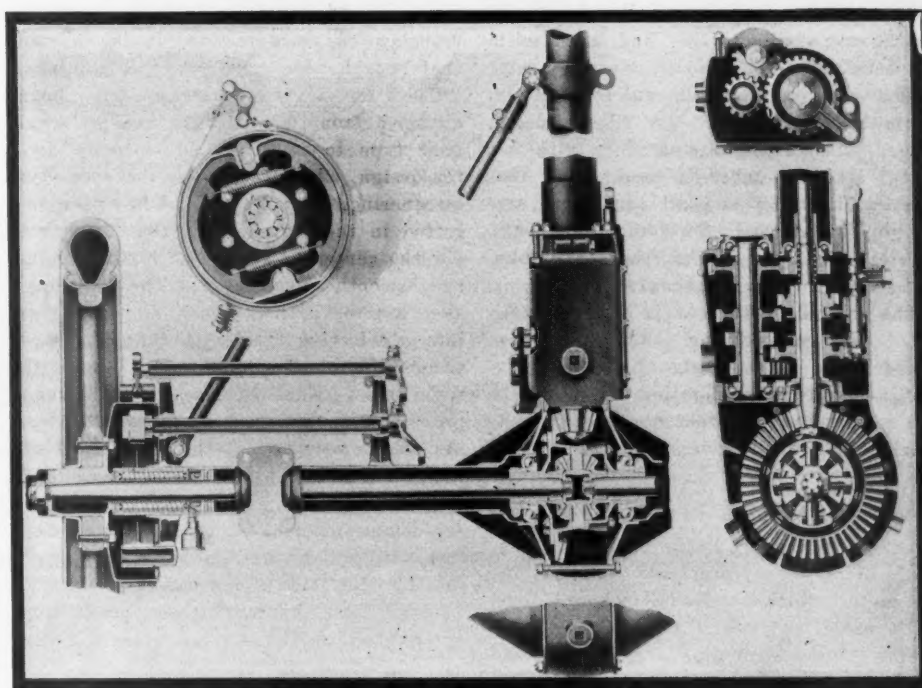
Lubrication by Splash

Lubrication of the motor mechanisms is by means of a splash system, with the required oil level in the splash compartments maintained by a vacuum feed from a reservoir cast integral with the crankcase. The spiral engine gears are separated from the main crankchamber and lubricated with a non-fluid grease.

Ignition is obtained from a Splitdorf dual system. The magneto is mounted substantially and accessibly on the left side of the motor and is driven by shaft from the engine gears which are thoroughly enclosed in an oil-tight and dust-proof case.

A vertical tube radiator, large centrifugal pump, ball-bearing stamped steel fan, belt-driven and adjustably mounted to maintain proper belt tension; and simple direct water manifolds are features of the cooling system.

The leather-faced cone clutch is conventional in design and provided with flat

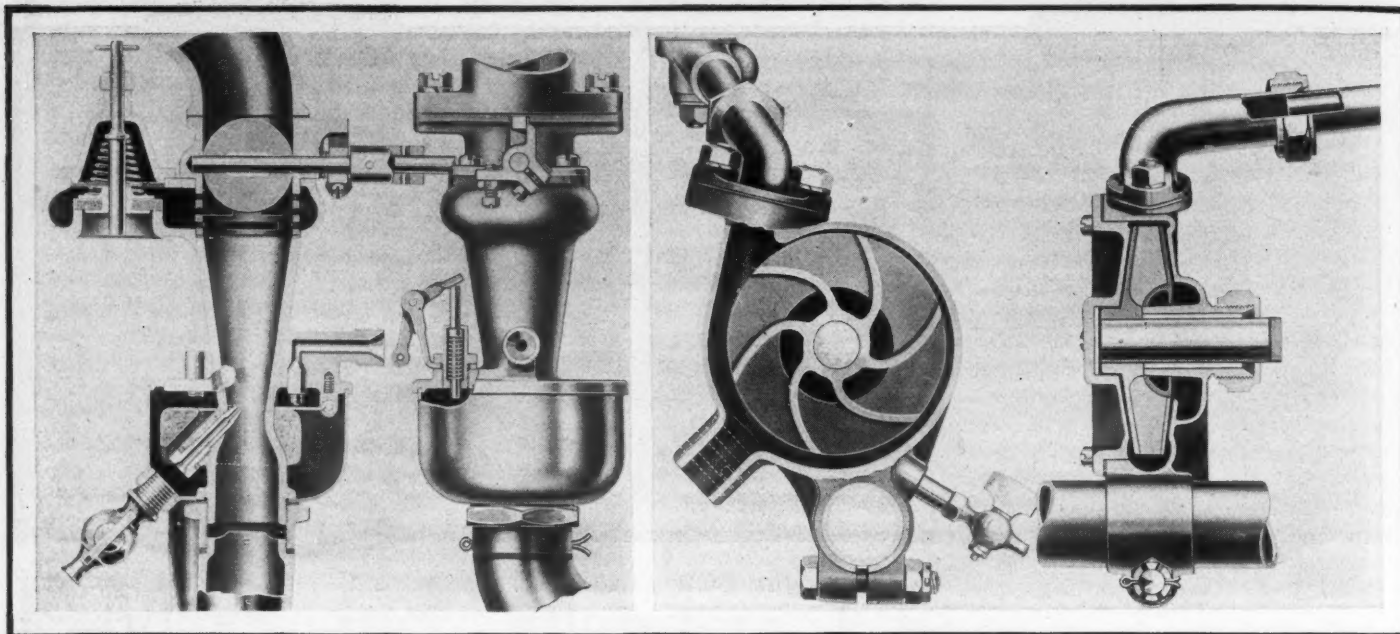


REAR AXLE DETAILS OF FLANDERS

springs under the leather to facilitate easy engagement. Power is transmitted from this clutch through a long propeller shaft having an encased universal joint at either end. Details of the transmission gearset construction are shown very clearly in the accompanying illustrations. The shafts are short and stout and both mounted in the same horizontal plane. This gearset gives three forward speeds and reverse with direct drive on the third or high speed. The housing of the gearset and the central portion of the rear-axle housing are cast integral. The right and left housing sections of the axle are drawn from sheet steel, heat-treated and fitted with

truss rods to give extra strength. A long pressed steel torque member communicates between the gearset housing and a cross member of the main frame, and radius rods extending parallel with the side frame members are provided to take the driving strains. The rear end of the pinion shaft, which is the main shaft of the gearset, is supported in a Timken roller bearing and Hyatt roller bearings, in hardened and ground removable sleeves, carry the load of the axle shafts.

Brakes are of the external and internal type acting upon the pressed steel drums of the rear wheels. The service brakes operated by pedal are the external con-



SECTIONAL VIEWS OF E-M-F CARBURETOR AND CIRCULATING PUMP

tracting ones, and being on the outside are easily adjusted. The emergency is of the expanding type, and both sets of brakes are double acting and lined with a special friction fabric.

The steering gear is an irreversible worm-and-sector type. An I-beam drop-forged axle forged in one piece with integral spring perches is used. And the steering knuckles and all connections are of drop-forged steel. Two-point ball bearings are employed in the front axle hubs and steering joints are bronze bushed.

The control of the car is conventional, with the gear-shifting and emergency brake levers at the right of the driver's seat, pedals for the operation of the clutch and service brake, a foot accelerator, and spark and throttle levers over the steering wheel.

Flanders 20 for 1912

As for the changes in the Flanders 20 for 1912, there are several improvements in the motor which render its various features more accessible and increase its power. The exhaust pipe is no longer cast integral with the cylinder, but is a separate fixture as in the E-M-F motor. The inlet manifold also is slightly changed so that the carburetor is brought back a little to make room for the magneto, which now occupies a more accessible position just to the rear of the front motor support. This change has necessitated the removal of the water pump to the front of the front cross support of the motor on the left, where it too is more accessible. The lowest point in the cooling system now is at the bottom of the water pump and a pet cock is provided at this point for the purpose of draining the system in cold weather. Instead of a cast iron crankcase an aluminum one now is employed and the oil reservoir is cast integral with it. By rendering the pushrods adjustable, the noiselessness of the motor may be

maintained; while by improving the contour of the cams, fitting a new carburetor with an adjustable needle valve, and increasing the compression, it is claimed that considerable more power is obtained.

The steering mechanism has been changed from an internal and external gear type to an improved worm-and-sector design, which facilitates the operation of steering. A rubber band has been inserted in the periphery of the clutch under the center of the clutch leather to insure smooth engagement. The transmission gearset is redesigned, converting it into a selective type with three forward speeds instead of a progressive design with two forward speeds; and a Timken roller bearing has replaced the radial bearing at the rear end of the main shaft of the gearset. Two pinions have been added to the differential. Brakes have been rendered more efficient by changing from the two internal expanding shoes arranged side by side, to an internal and external design. Thus, by having one brake acting on the inside and the other on the

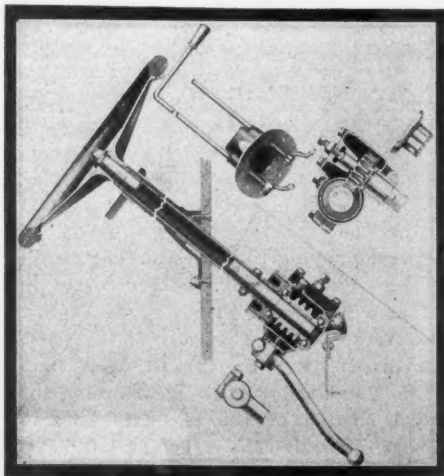
outside of the drum, a considerable increase in braking surface is obtained.

Five Body Types Made

The Flanders 20 line for 1912 comprises five body designs: A fore-door touring car, a four-passenger suburban or surrey type, a fore-door roadster, a racy roadster with a cowl dash, and a coupe. These are fitted to a single chassis design whose characteristic features are a four-cylinder en bloc motor, a leather-faced cone clutch, a propeller shaft inclosed in a torsion tube, a selective sliding gearset in unit with a semi-floating rear-axle, an I-beam front axle, pressed channel steel frame, semi-elliptic front and scroll elliptic rear springs, wheels equipped with 30 by 3-inch tires, a 102-inch wheelbase and standard tread.

Perhaps the most original and most striking feature of design in this car is the method by which several major features are incorporated in one unit. The motor, with its magneto, pump and carburetor; the radiator, steering mechanism and dash are all carried on a sub-frame consisting of two parallel steel tubes. These tubes in turn are supported on cross members and secured by four bolts. By the removal of these four bolts the entire unit can be lifted from the chassis and another unit substituted. This accomplishes the dual purpose of simplifying manufacture—reducing cost and selling price—and makes it possible to effect repairs conveniently.

The accompanying illustrations show many of the interesting details entering into the construction of the various features. The cylinders are of an L design and all contained in a single casting. This gives a short, compact motor and permits of the use of a short, two-bearing crankshaft. The cylinders have a bore of $3\frac{3}{8}$ inches, a $3\frac{3}{4}$ -inch stroke, and have cast integral with them valve chambers and



DETAILS OF E-M-F STEERING GEAR

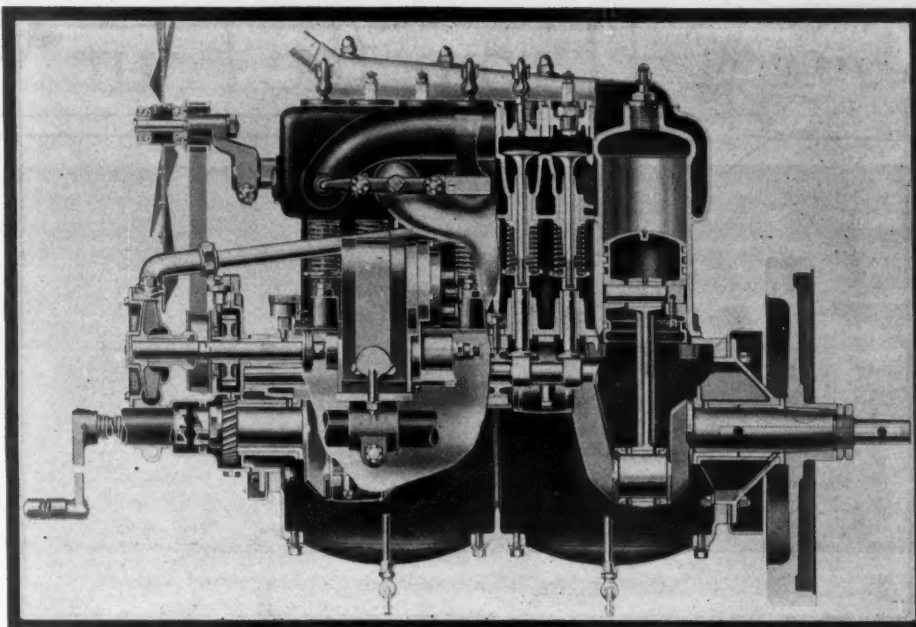
waterjackets. A barrel-type crankcase also is used with this motor, into which the crankshaft is inserted through the rear end; and the bearings being supported by the end plates that close the ends. Four hand holes are provided at the bottom of this case through which access to the internal mechanism is possible. These plates are depressed to form splash basins for the lubrication of motor, and two yokes are used to hold the plates in position.

Suspension of Motor

The suspension of the motor is on the three-point principle, though effected in a manner slightly different from any of the other popular constructions. Arms, cast integral with the rear end plates of the crankcase, carry the rear end of the motor, while the front end is carried in a cast support that will permit sufficient revolving action to relieve the motor of all strains due to contortions of the frame while traveling over rough or uneven roads.

The crankshaft, camshaft and connecting rods are all drop forgings, and heat-treated to give them strength. The crankpins are $1\frac{1}{8}$ inches in diameter. Cams of the camshaft are forged integral therewith and the contour of the cams as well as the finish of the bearings surfaces is done by grinding. Connecting-rods are of I-beam cross sections with split bushings and caps at the lower ends. Phosphor bronze bushings are employed for the camshaft and piston pin bearings, whilst the crankshaft and crankpins run in die-cast babbitt bushings.

Flat-head pistons are employed, each having three eccentric compression rings above the piston pin, and three oil grooves below the pin. Bevel-seated valves are used, operating in guides that are pressed into place; these may be removed and replaced with new ones should they become worn. All reciprocating parts are carefully weighed and balanced to eliminate vibra-



CONSTRUCTIONAL FEATURES OF FLANDERS MOTOR

tion and insure smooth running, and spiral engine gears and adjustable valve lifters are employed to promote silent operation.

Lubrication of the motor is by means of a vacuum-feed splash system working on the same principle as that of the E-M-F.

A Splitdorf dual ignition system is fitted, with the magneto mounted on the left side of the motor and driven by shaft from the same gear that drives the water pump.

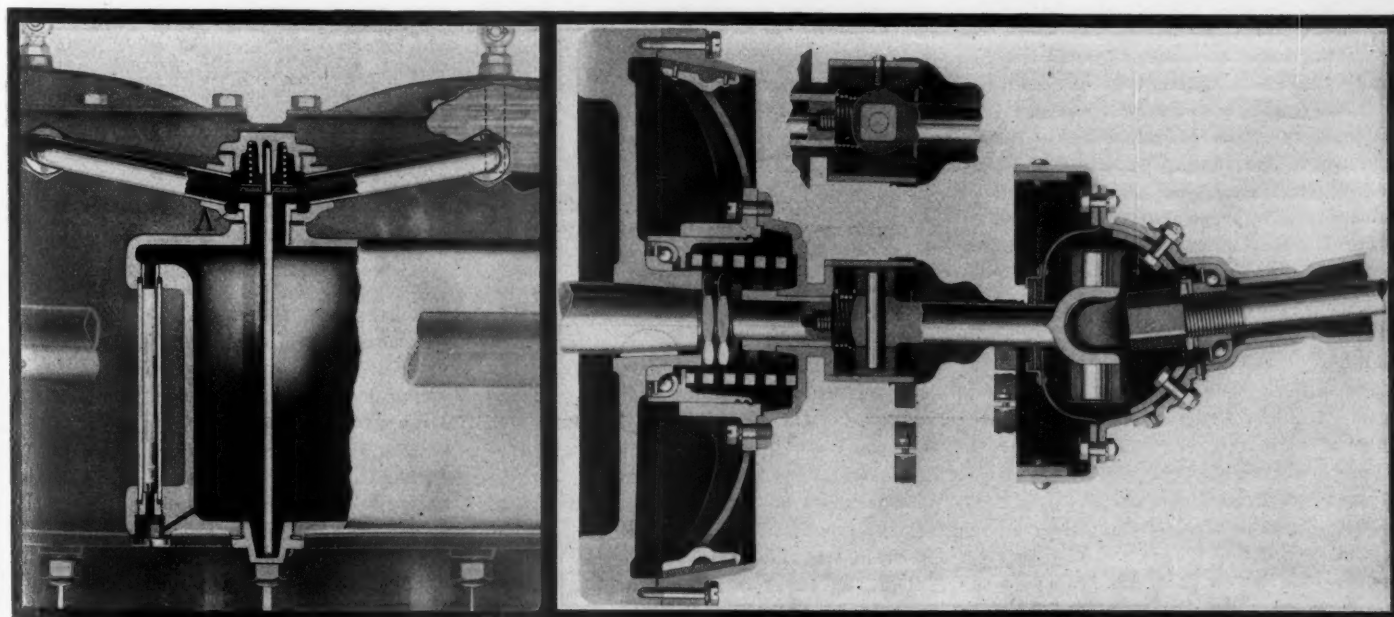
In the cooling system the water circulation through the vertical tube radiator and the waterjackets of the cylinders, is maintained by a centrifugal water pump; while the air drift through the radiator and around the motor is augmented by an adjustable belt-driven fan.

Power from the motor to the gearset is transmitted through an inverted cone clutch whose simplicity is shown below

and through a propellor shaft having a single universal joint at its forward end. This joint is thoroughly inclosed by the large ball and socket connection that joins the forward end of the torsion tube to the cross member of the main frame.

Gearset Small and Compact

The gearset is small and compact with its countershaft arranged directly above the main shaft. Two shifting levers enter the bottom of the case, which is of cast aluminum, and the general arrangement and operation is very simple. On the third or high speed the drive is direct from the propellor shaft to the driving pinion with all driving strains relieved from the countershaft and its gears. The bearings all are of the adjustable cup-and-cone design except the one on the rear end of the main shaft which is an adjustable Timken roller bearings.



CLUTCH AND UNIVERSAL JOINT WITH DETAIL OF VACUUM OIL FEED OF FLANDERS



From the Four Winds



DEMONSTRATING TOUGHNESS OF INNER TUBE

REMOVES Ban on Klaxon—The Denver fire and police board has removed its restriction against the Klaxon horn, and has issued a special order allowing its use on the streets of the city under certain conditions.

Oiling Milwaukee Streets—The city of Milwaukee oiled exactly 71 miles of streets during 1911, or 50 per cent more than in 1910. The cost of oiling for 1911 is .0402 per foot as against .0550 in the previous year.

Mountain Record Broken—The record for climbing Mt. Hamilton, Cal., has been shattered by a Buick roadster, which accomplished the feat of climbing the grade from Smith's creek to Lick observatory, a distance of 7 miles, in 23 minutes, negotiating this severe grade and the 265 turns all on high. The car was driven by J. E. Sloan, Buick distributor at San Jose, Cal.

Not Enough Money—The inadequacy of \$48,000, which it has been announced will be the amount recommended by the department of the interior to congress for the improvement of roads and trails, etc., on Mt. Tacoma, is being advanced by many interested in the development of this national park. Congressman Stanton Warburton, acting on this well known public sentiment, has sent a telegram to President Taft, asking him to use his influence toward the appropriation of \$250,000 by congress for the road and other improvements.

Another Veteran Passes Away—The death of Joseph D. Price, the surviving member of the well known hotel firm of Anderson & Price, a few days ago and so soon after Mr. Anderson's death, removes another man for whom motorists everywhere had the highest regard, for with Mr. Anderson he aided in developing the motor highways of New Hampshire in the region of Bretton Woods and also in placing Ormond beach prominently before the motor world. Mr. Price entered heartily in the work of getting the Glidden tour-

ists to visit Bretton Woods, and he was prominent in arranging the details for the climb to the clouds up Mt. Washington; the endurance runs of the Bay State A. A. to the mountains and return; the Crawford Notch hill-climb, and the annual tournaments on Ormond beach.

Money Spent in Good Cause—It is stated that the erection of route and danger signs for the present season will have cost the Automobile Club of Syracuse, of Syracuse, N. Y., over \$1,000 by the time all returns are in. The club officers are sending out circular letters urging the co-operation with them of all motorists in work for good roads and the enforcement of existing speed and regulation laws.

Means a Lake Shore Drive—The last big obstacle in the way of the construction of the main links in Milwaukee's lake shore drive project, which will ultimately connect with the Sheridan drive in Chicago and northward, has been overcome by the action of the secretary of war in giving the city of Milwaukee permission to build revetments 1,000 feet from shore in Milwaukee harbor. The intervening space will be filled in for the drive. The permit must be availed on or before December 31, 1914.

Want Road Relocation—The Massachusetts motor organizations are calling the attention of their members to the importance of working to have passed the proposed amendment to the state constitution giving state, county, city and town officials authority to relocate highways, streets, etc., and where there are many dangerous curves they may be eliminated by these officials who now are restricted to certain conditions governing property so that they cannot proceed except through special legislative acts. It is an important change and it may be brought about, as there is much sentiment in favor of it. At the last state election the first stage was passed by the voters as-

senting to the preliminary steps being taken. But it must go before the voters again and then pass the legislators to become effective.

Encourages Fast Driving—Fred C. Shaffer, secretary of the Grand Junction chamber of commerce, on behalf of the Fifty Thousand Club of Grand Junction, Colo., has announced a prize of \$500 to the owner of the motor car carrying four passengers and making the fastest time between Denver, Colorado Springs, Pueblo and Grand Junction. The offer is good for 1 year.

Studying Electrics—The Massachusetts Institute of Technology has been studying the practical and economical position of the electric vehicle for general purposes of transportation recently under the guidance of Professor D. C. Jackson, assisted by a corps of students and instructors. They have traveled to various large cities where electric vehicles are in general use, making careful comparisons on the performances of the machines, together with the street conditions. In many places they have found vehicles that have been in use 5, 7 and 10 years, giving them excellent data.

Unique Decorations for Motor Cars—Decorated with such trophies of the chase as the skins of bear and other wild animals and with the snarling head of a mountain lion over the hood, the car of Mrs. L. G. Carlton received the first prize at the recent carnival at Cripple Creek, Colo. Sage brush, guns and fishing tackle and a party of campers in khaki and som-breros formed a harmonious combination, the red bandanas about the throats of the hunters giving the only bright touch of color. There was a genuine impulse behind this decoration, as the owner and friends have used the car in hunting and fishing trips over the greater part of Colorado and Wyoming. The car is a six-cylinder Thomas.

Call Pushmobiles a Pest—Ever since the running of the Fairmount Park road race in Philadelphia, youthful imitators of the racers in pushmobiles have been holding contests in all sections of the city. So far has the craze developed that the little machines have become a nuisance and a well-defined movement is under way to put a stop to it, or at least regulate the little speeders. Motorists in particular are up in arms and loud in their complaints to the police authorities. As is perfectly natural, the little wagons are run only in the well-paved streets which are frequented extensively by motor cars, and many a hair-breadth escape has been recorded wherein one of the youngsters has come shooting around a corner directly in the path of

a motor car. Though in all the contests the boys have sentinels with flags stationed at various points around the course, the average motorist is inclined to disregard the signal and look upon the whole matter as a joke.

State Aid a Boon—That the new Wisconsin state aid for highway improvement law is more acceptable than anticipated is proven by the fact that a number of townships have decided to issue bonds to cover the entire improvement, payable during a series of years, and do the work in a single year. The attorney general has decided that this is proper. It is expected that many other townships will now issue bonds and consequently a much larger amount of good roads construction will be done in 1912 than dreamed of by the supporters of state aid.

To Signboard Pennsylvania—State Highway Commissioner E. M. Bigelow, of Pennsylvania, is securing reports from the engineering and surveying corps of his department on the number of sign posts that will be required to take care of the routes of the main highways of the state. The data is being secured preparatory to awarding contracts for sign posts. "The absence of sign boards is the most notable of defects in the highways of the state at present," says the commissioner. "I hope to have the first posts placed this winter. They will be of iron and the most modern and durable type."

Have a Boulevard Project—A meeting was held in the rooms of the board of trade by a number of motor car owners in Indianapolis on the evening of November 27, to discuss the question of building a boulevard from Indianapolis to Noblesville, approximately 20 miles. If the project can be financed, an 18-foot roadway, paved with a combination of crushed stone, sand, oil and asphalt, will be built and all railroad grade crossings will be eliminated. It is proposed to use the Allisonville road. It is probable the commissioners of Marion and Hamilton counties will be asked to share the expense.

Truly a Tough Run—What would the Gliddenites think of an endurance contest more than 1,400 miles long, stretching through uninhabited wildernesses and mountain ranges, where the tourist travels hundreds of miles between supply stations, and where controls are only a tent or a trapper's hut; a contest starting at a northern city and finishing nearly to the arctic circle? Such is the Vancouver, B. C.-Dawson run, the rules of which have just been made public by the Pacific Highway Association. It is hardly likely this tour could have been made for a number of years had it not been for the recent discovery of enormous coal deposits at Groundhog mountain, about 140 miles north of Hazelton, B. C. Interest over all the province is so high that it is thought the government will speedily construct a good wagon road to those fields, thus also forming an important link in the Dawson

route. According to the rules, the entrants must start at Vancouver or any more southern point, and must finish at Dawson or any other Yukon or Alaskan settlement as far, or farther, north. Complete sets of pictures must be taken, a log-book kept, and Pacific highway pennants carried on the car.

Nebraskans to Meet—The first convention of the Nebraska Automobile Association will open at the Rome hotel, Omaha, on Monday, December 4. It will be a 2-day session. There will be 150 delegates, many alternates, and other motorists from over the state who are interested in the new association. The delegates represent sixty-three county motor associations, and more than 3,000 members.

New Good Roads Bodies—The Quebec-Miami International Highway Association was formed in Richmond, Va., last week by the election of Howard D. Hadley, of New York, president; George A. Simard, of Montreal, vice-president, and Norman M. Parrott, of Baltimore, secretary. Another association formed was the National Association of Road Material and Machinery Manufacturers, representing a capital of \$200,000,000. This association will meet annually with the road congress. The officers are: W. J. Beatty, Chicago, president; S. K. Phillips, Pennsylvania, vice-president; D. T. Pierce, New York, secretary-treasurer.

Sets Dates Early—The Pacific Highway Association has decided to hold its next annual meeting at San Francisco, August 5, 6 and 7, 1912. The date has been purposely placed early so that good-roads men and motorists may have plenty of time to consider a schedule which will permit them to motor to the convention. Delegates from all parts of the continent will be invited to take part in the meetings. South America will be represented by men of prominence from every republic through which the Pacific highway will ultimately be extended, and other advo-

cates of great trunk roads, such as the Canadian highway and the Lincoln-Jackson memorial, are to be on hand to give the benefit of their experiences.

Change of Secretaries—At the annual meeting of the Quaker City Motor Club, to take place early in December, Clarence Cranmer will be selected for the secretaryship of the organization, vice A. T. James, resigned. The annual banquet will be held some time in January, and it is expected to have a long list of notables present.

New Club House Certain—Final settlement having been made for the remainder of the $\frac{3}{4}$ -acre lot at Twenty-third and Market streets, the new home and garage of the Automobile Club of Philadelphia is expected to soon assume definite shape. Contracts for grading and foundations of the garage will be let within the next fortnight. The new building will occupy a lot of 220 feet by 136 feet. The Automobile Club of Philadelphia has raised through private subscriptions \$700, nearly \$500 of which was pledged by members of the club and the balance by dealers throughout the city, to further the cause of good roads. The subscription was primarily for the purpose of macadamizing the Oxford valley road.

Testing Inner Tube—Rubber not only stretches, but in some cases it has phenomenal pulling powers, as was demonstrated by Don. C. B. Van Duzen, general representative of the Consolidated Rubber Tire Co., at Jacksonville, Fla. In order to demonstrate the reliability of Kelly-Springfield tires, he took a 32 by 4 inner tube and attached it to the front of an E-M-F 30 touring car carrying four passengers, the total weight of which was about 2,500 pounds. The other end of the tube was attached to the rear of another car. In this manner the E-M-F was pulled for 15 miles over the city streets and country roads, through sand and up hills, and on arriving at the garage it was found that the tube was ready for use in a tire.



PRIZE WINNER IN PARADE AT CRIPPLE CREEK, COLO.

IN the economy of agricultural tractors, the soil area worked by the implement which the tractor draws in a given time and at a given fuel cost, is the first consideration. The greater the width of the work done at one trip of the tractor the less dead weight is transported, since the locomotion of the tractor is in itself a loss. The more rapidly the machine works the smaller is, of course, the proportionate cost of the human labor. A tractor adaptable for different kinds of work, of which plowing is the heaviest, must be able to overcome the resistance of this work, even uphill, by means of the adhesion of its driving wheels and the traction secured thereby; but if the tractor is made very heavy with this end in view, its economy for lighter work is reduced and its speed for a given motor power and fuel consumption also is reduced. The object of constructors, therefore, should be to secure traction by other means than weight.

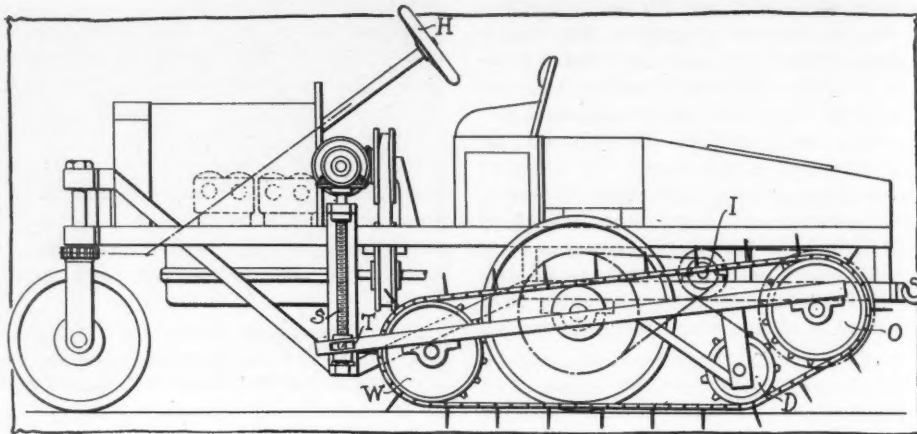
Whether the principle of the tractor drawing an implement which must be attended by additional human labor is as well adapted for the economical needs of the small or moderate-sized farm as the specialized motor plow, harrow, cultivator or hoe which usually is of smaller working capacity but in which the agricultural implement and the motor power are in some instances operated by the same person; of which type the German Stock-motor gangplow is an example. On this subject the opinions are as yet sharply divided and the correct answer probably depends upon which of the two methods receives the greater impetus from inventive and engineering talent.

From information offered in *Le Génie Rural*, a journal specially devoted to agronomic engineering supplemented by drawings printed in *La Vie Automobile* reproduced herewith, it is seen that the tractor constructed by Edmond Lefebvre and exhibited at work at the competitive trials of agricultural motor machinery held this year at Roubaix in France probably represents the greatest advance step so far taken in combining great working capacity with small weight and labor cost. It is stated moreover that this type is now manufactured in another size smaller than that shown in the illustrations.

In the Lefebvre tractor the traction secured from the large driving wheels W may be supplemented whenever the necessity arises by bringing into action against the soil two endless chains C studded with paddles, these chains revolving around two auxiliary wheels or sheaves on each side of the machine.

The motor car features of the construction include a four-cylinder Gnome motor of 24-30 horsepower cooled by water circulation through a Solex radiator of the type recently described in *Motor Age*; a multiple-disk metallic clutch, four gear speeds, giving 2½, 3, 6½ and 9 kilometers per hour for work and the high 11 kilo-

The Realm of the



SIDE VIEW OF LEFEBVRE TRACTOR

Farm Tractor Design

meters for the road. The single steering wheel in front, mounted as castor, is operated from a steering post and crown by worm and pinion.

Referring to the illustrations, showing elevation and ground plan of the machines, the shaft I, driven by shaft and bevel gear from the motor, carries two sprockets J and K, one of which actuates shaft M which drives the adhesion chains. The other drives the driving wheel shaft F by means of sprocket wheel G mounted on the differential gear. The frames supporting the adhesion chains, at the hubs of the sheaves on which they revolve, may be raised and lowered by operating the long screwbolts S and P, to which the frame is secured by swiveled nuts T. At the top, each of the screwbolts carries a bevel gear pinion U in mesh with another pinion, on the shaft of which there is mounted an operating device comprising bevel pinions X, and the belt and pulley set Y connecting with motor shaft Z. The tension idler D is controlled from the driver's seat by hand power.

By this system, permitting the adhesion chains to be raised and lowered by the motor power, in conjunction with the other features, the turning of the machine at the ends of the furrows is so facilitated that it can be accomplished in 60 to 70 seconds.

Behind the driver's seat a fuel tank—benzol is used in France—holds 26 gallons and at the rear end of the chassis a box is mounted which is large enough for stowing away all the accessories needed for the agricultural work including the chains for hitching ploughs or binders or harrows to the tractor.

The construction also includes a special device, not described, for keeping the adhesion chains clean during the work, so

that the steel paddles—of which fourteen are pressed into the soil at the same time when the chains are in use—may enter the ground readily. The weight of the machine in working order is given as only 6,225 pounds and it is capable of exerting a traction effort equal to a draw bar pull of 2,640 pounds.

MAKES GOOD ON FARM

The motor truck has made good in 3 years' of service on a farm. The results attained indicate that the new vehicle is an essential feature of the equipment required for progressive agriculture conducted on a large scale.

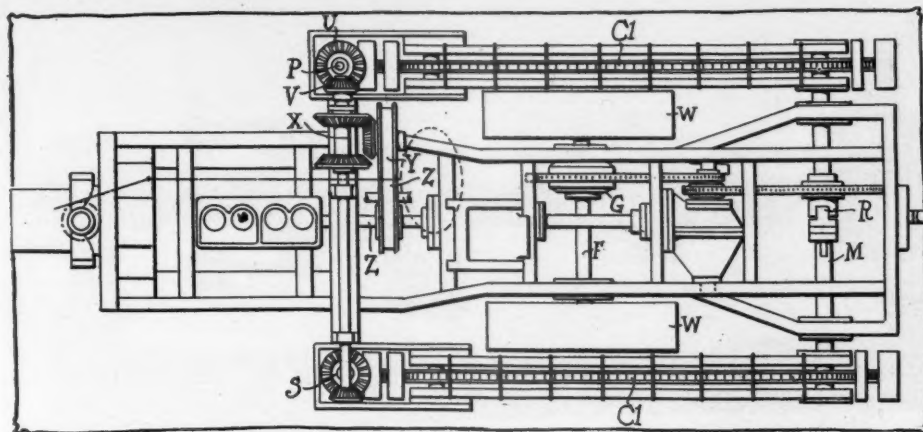
It was just 3 years ago that Conyer's farm took delivery of its 3-ton Packard truck with platform body. The truck has traveled 30,000 miles and its repairs and replacements, the latter being limited to brakes and springs, are said to have amounted to less than \$200.

Conyer's farm is large for the east. It covers 1,600 acres in Connecticut and a small tract in New York state. It is located some 7 miles inland from Greenwich, Conn. This year's apple harvest amounted to 3,500 barrels, while the peaches filled 10,000 baskets.

The truck runs between the farm and the town of Greenwich, a distance of some seven miles. Products of the farm are hauled either to the railroad station or steamboat pier and supplies are brought back, the odometer often registering 20 miles for a round trip. When not busy in this work, the truck is used in hauling from the fields and orchards to the barns.

Two teams of two horses each are required to carry the load of the truck, which is 3 tons, and the truck can make three round trips while the horses are making one. It thus displaces twelve horses.

Commercial Car



TOP VIEW OF LEFEBVRE TRACTOR

THE Boston fire hazard commission, which has been holding sessions for the past few months with an idea of learning how the city could be improved in the way of fire protection, has about finished its labors and is ready to make a report. The commission will not discuss what it is about to recommend until it notifies Mayor Fitzgerald and Chairman John A. Sullivan of the finance commission of its conclusions in a lengthy report. However, the Motor Age representative has been able to learn that the commission has decided to recommend that the city purchase as soon as possible eight pieces of fire apparatus for the suburban districts, where there are a lot of wooden apartment houses which would make a bad fire.

The probabilities are that these vehicles will be the combination chemical type that may make quick runs to various parts of the districts as some of the areas are very wide. They will form an auxiliary preventive squad. The commission, together with Mayor Fitzgerald, made a visit to Springfield, Mass., recently, and inspected the fire apparatus there, and every one was much impressed with the different types of chemicals, engines and ladder trucks comprising the equipment of the Springfield department.

That additional pieces of apparatus will be recommended for the business district soon, is apparent from the views of Mayor Fitzgerald, who believes that with motor-propelled apparatus the scene of a fire could be reached quickly, but not only that, the apparatus could be maneuvered in the narrow streets of Boston to better advantage than the horse-drawn vehicles, which together with the lowering of the upkeep cost, would be a valuable asset for the city.

The city and police officials of Somerville, Mass., were given an admirable object lesson on the needs of the city in the

Boston Is Converted

way of a motor patrol wagon recently. A call was sent for the wagon to one of the boxes and to reach the place the driver had to climb one of the streets in a hilly section. The street happened to be slippery and when the wagon got partly up the horse could not keep his footing. Suddenly the weight of the wagon began to haul the horse backward, and before anything could be done to block the wheels the patrol slewed, one of the wheels cramped under the body and over it went on its side, throwing out the driver and the patrolman inside and pulling the horse off its feet. There was a bad tangle and the driver was badly bruised.

It took a long time to get the mess fixed up again. What eventually became of the man who was being held at the box was not learned, but as the night was not cold he probably did not mind the delay. Had the patrol been responding to a call where someone had been injured, the chances of the victim dying would have been greatly increased as the result of the accident.

A splendid example of the value and efficiency of motor fire apparatus was afforded at Monson, Me., one night recently when a fire broke out in the business district. The town had just purchased a motor fire wagon and it had been in commission but a few hours when the fire broke out. The blaze got a good start before it was discovered and several buildings were burnt. Help was asked from Bangor as the entire town seemed doomed, but the gasoline fire engine was placed in a good position and by playing powerful streams checked the fire and saved the village so the aid call sent to Bangor was recalled. The engine had to work practically alone, as the only other apparatus in the town of use was an old fashioned hand tub. And there was a bad wind

blowing, too. The utility of the motor was fully demonstrated.

Had it not been for the motor apparatus a \$50,000 loss would have been turned into one far greater and many families would have been homeless, while the entire business section would have been destroyed. The residents are delighted with the apparatus, for they realize now that it paid for itself many times over in its first baptism of fire, and the doubters who were sceptical of its worth are no longer so. That a number of other towns will adopt motor apparatus now is a foregone conclusion, as the fire was big enough to get headlines in the metropolitan papers and the work of the motor apparatus was given its full share of credit, which is bound to produce results.

WISCONSIN BUYING CARS

The city of Milwaukee, which owns sixteen motor cars, is considering the purchase of six additional cars. Three will be for the use of assistant chiefs of the fire department, two for the health department and one for the consolidated police and fire alarm signal service. Henry Campbell, city purchasing agent, says that the city will make money by buying a runabout for every employee whose services are worth \$5 or more per day, if his duties require him to travel from one part of the city to another. Mr. Campbell answers criticism that the city is purchasing too many cars by proving that motor equipment is cheaper than horse equipment. For instance, if the city would supplant all of the horse equipment of the consolidated fire and police alarm service with motor cars there would be a saving of \$719 annually, at the most conservative figuring.

The city of Racine, Wis., is in the market for a combination hose and chemical truck for the fire department, to cost not more than \$5,000. The city will also purchase a chassis upon which will be mounted the present police patrol body. The cost of the chassis is not to exceed \$1,500.

TAXICAB RATES LOWERED

The Canada Auto and Taxi Co., of Montreal, announces that to comply with the ever-increasing demand for taxicabs it has decided to reduce its fares by one-half during business hours. Thenceforward the meters will register the following rates:

Tariff 1—Application to one or two persons, from 6 a. m. to 7 p. m., 20 cents per mile.

Tariff 2—Applicable to one or two persons, from 7 p. m. to 12 m., or three or four persons from 6 a. m. to 7 p. m., 40 cents per mile.

Tariff 3—Applicable to three or four persons, from 7 p. m. to 12 m., 50 cents per mile.

NIGHT WORK

From 12 m. to 6 a. m., one, two, three or four persons will be charged tariff 3 with 20 cents extra per trip or per one-half hour drive.

WAITING TIME

Day or night work, \$1.50 per hour.

Trunks or any luggage or parcel carried on front seat, 20 cents apiece.

Outside city limits—If car called empty to go outside city limits, tariff 1 will be applied to go, return trip being charged according to above indications.

Returning empty from outside city limits—Charged half fare to go.

Development Briefs

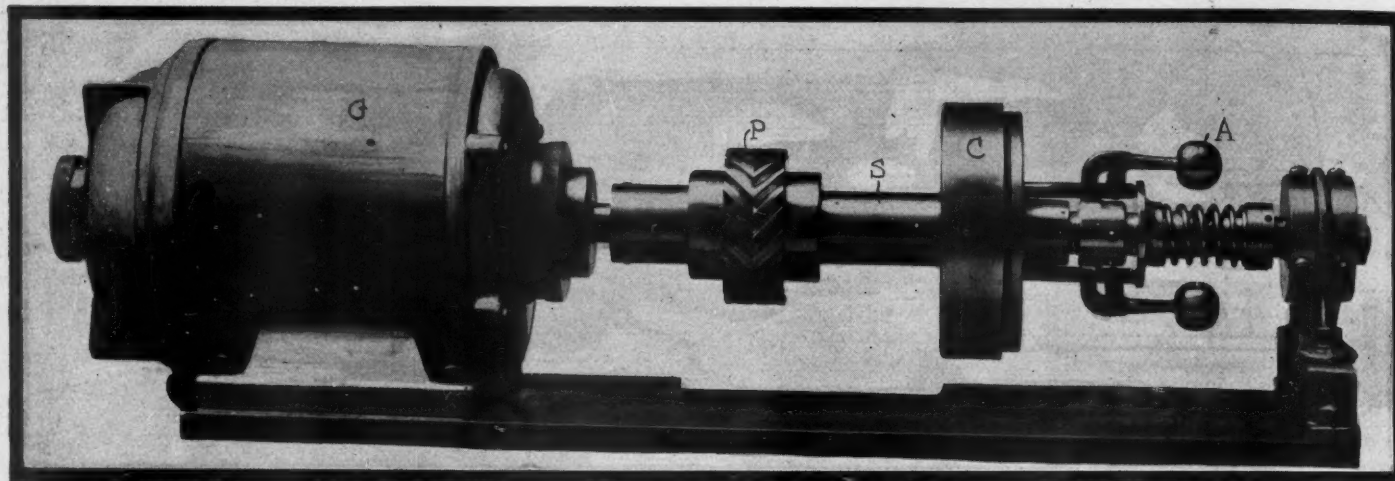


FIG. 1—THE O'NEILL ELECTRIC SELF-STARTER, WITH GENERATOR G, DRIVING PINION P, CLUTCH C AND GOVERNOR A

ELECTRIC SELF-STARTER

THERE has just recently been perfected and is soon to be offered to motor car manufacturers a combination electric motor starting and car lighting and ignition system that possesses many ingenious features yet which is fully automatic, simple, fool-proof and practical in the hands of the general motoring public. There has been formed a \$250,000 corporation called the O'Neill Electric Starting and Lighting Corporation, Detroit, Mich., to manufacture the device.

Unlike any other self-starting device, the O'Neill system consists in vaporizing the gasoline within the carburetor by electrical means, relieving cylinder compression by unseating the exhaust valves, and producing suction, compression and ignition by electrical means.

Button in Carburetor

An electrical button, which is in circuit with a storage battery and is insulated by enamel both electrically and chemically, is secured inside the carburetor so that when a switch is closed the gasoline flowing through the carburetor becomes vaporized instantly, thus producing a homogeneous mixture in the coldest weather when suction is created.

Suction and compression in the engine are produced by a special form of motor-dynamo, which the inventor terms an electric-torque generator, because it generates large quantities of electricity and also develops strong torque. This generator turns the crankshaft.

This generator G, Fig. 1, is mounted rigidly on a metal base and on its shafts carries a double spiral or herringbone pinion P, secured to a sleeve carrying an aluminum cup C. The cup and gear run idly on the shaft until the cup is engaged by the friction cone clutch of tarred fibre that is feather keyed to the shaft. The cone is held in the cup by a spiral spring, and the electrical output of the generator is regu-

lated automatically by a centrifugal governor A, that revolves with the shaft and acts on compound lever arms, which engage or disengage the clutch according to the speed.

The electric-torque generator weighs 40 pounds and has a capacity of 35 amperes at 16 volts, turning 2,500 revolutions per minute. It will safely stand an overload of 30 per cent for an hour at a time. Maximum heating is 46 degrees Centigrade above the surrounding atmosphere. As a motor it develops torque sufficient to turn the 60-horsepower Thomas engine at 200 revolutions per minute.

This assembly of generator, transmission gear and regulating mechanism is attached securely to the base of the engine, underneath, and on the side opposite to the gear-set levers. The herringbone gear is lined up and intermeshed with a similar gear F on the flywheel of the engine or its equivalent. This type of transmission was selected as the most efficient, 98.5%, and most silent, efficiency being of prime importance in consideration of the light apparatus that must be employed and the strong torque necessary to turn the engine. In some cases,

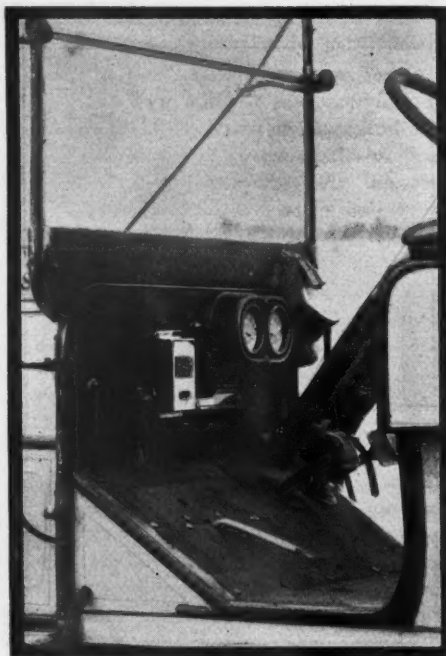


FIG. 2—THE DASH EQUIPMENT FOR O'NEILL SELF-STARTER, SHOWING THE OPERATING PEDAL AND ELECTRICAL MEASURING INSTRUMENTS

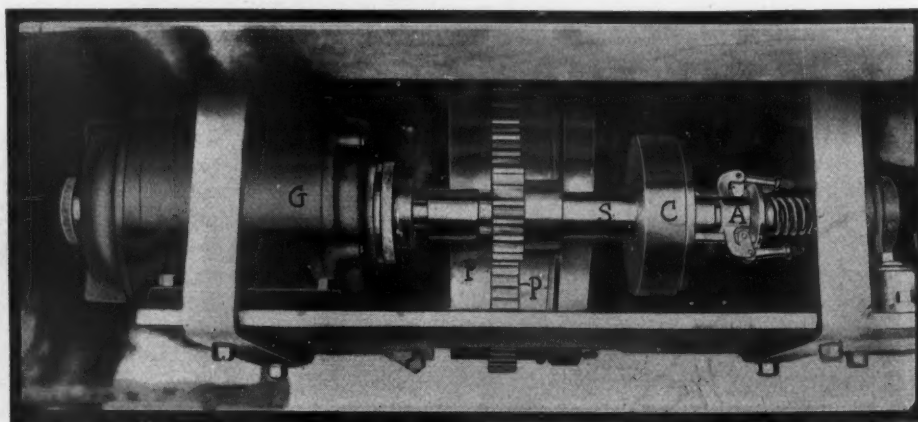


FIG. 3—O'NEILL SELF-STARTER ON METAL BASE BOARD OR MOTOR

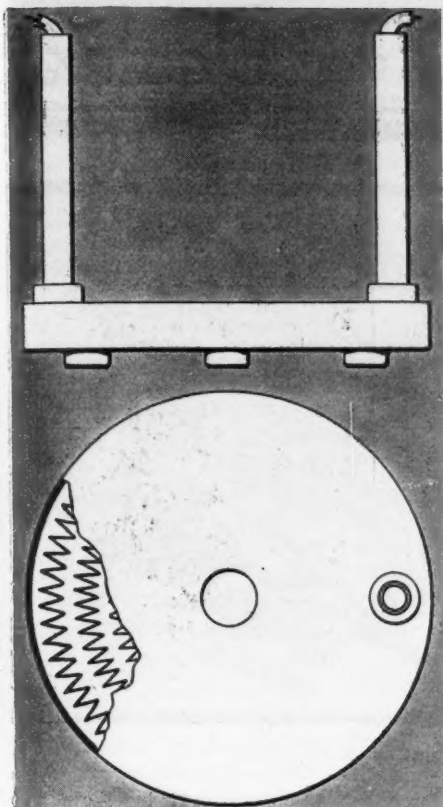


FIG. 4—O'NEILL ELECTRIC VAPORIZER

however, friction drive is used, and again, according to circumstances, Maxim or Morse silent chain is desirable.

Storage cells of a special type to meet the exacting conditions are employed. They have a high rate of discharge for starting the engine, and a high rate of charge for restoring the cells quickly. As made for use of the largest cars the weight of the battery is but 72 pounds, but for smaller engines 60 pounds would suffice. About 80 amperes for 1 second is the requirement for starting the engine, but these 80 ampere-seconds are more than returned in 60 seconds' running with the dynamo generating 35 amperes, allowance being made for electrical, mechanical and electro-chemical conversion losses. By a special treatment of the plates, the battery can go all winter without injury.

When running as a shunt dynamo, driven by the engine, the generator charges the battery, from which current is drawn for lighting and ignition. A magnetic cutout automatically opens the circuit between the generator and battery when the latter is fully charged to its normal 16 volts.

For starting duty the electric-torque generator is a compound wound motor, driven by current from the battery. The operation is as follows:

A downward movement of a pedal on the floor boards closes the circuit and sends current from the battery into the button in the carburetor, unseats the exhaust valves, throws the series field in series with the armature and sends the current in the same direction through the series and shunt fields so that they reinforce each other to develop high torque. Suction, compression and ignition follow.

Upon raising the foot, the vaporizer and series coils are cut out and the circuit is opened again, the motor once more resuming its function as a dynamo. All operations are automatic except the movement of the pedal and the setting of the ignition switch, as in starting by hand.

With this electrical system the inventor gets remarkable illumination of his car for night driving and utilizes the current in other ways that are unique. He employs three 100-candlepower headlights, two 32-candlepower side lights, one 16-candlepower tail light and one 8-candlepower dash light.

A novel refinement in touring car luxury made possible by the O'Neill system is the serving of warm meals and cold drinks at picnic lunches. Chafing dish, broiler, toaster, coffee pot and egg boiler, all made for the 16-volt circuit, are furnished by the company as touring car equipment, and there is also an ammonia refrigeration process supplied with power from the transmission shaft.

AUTOMATIC RECORDER FOR TRUCKS

One of the chief elements in keeping up the efficiency of commercial vehicles whether in the haulage of goods or in taxicab service, is the maintaining of the most economical schedule. This necessitates that those in charge of the service keep closely informed of the movements of the vehicles while on the road and learn whether the driver has speeded his car or been idling on the road.

An automatic recorder intended to be installed on the car to keep tab of the driver has been brought out by the maker of the Jones speedometer, at New Rochelle, N. Y. It consists of a chart upon which time, speed and distance of travel are recorded, as well as the number and length of stops.

This instrument, shown in Fig. 5, comprises a specially constructed clock mechanism in a heavy brass case which is attached to the body of the car and a

strong, flexible shaft connecting with the wheel by means of gears; this cable operating a recording stylus which marks on a circular dial of specially prepared paper which is turned by the clock mechanism. These dials are designed for daily or 36-hour records and are readily changed at the end of that period.

The record disk shows the time at which the vehicle leaves the garage, number of stops made during the day, the duration of each stop, mileage covered between stops and time the vehicle returns to garage; also the speed at any time during the day can be ascertained. This information gives a perfect check on the delivery expense and also shows the efficiency of both the vehicle and driver.

Fig. 5 also shows a record disk taken from the recorder from one of the trucks in the service of a brewery and shows a day's operation. The disk is divided into 12 hours, representing one-half day, and revolves twice for the whole day or 24 hours. The cross lines show the car movement, each line indicating one-half mile of travel while the circular line shows the duration of the stop, that is, the time the vehicle is stationary. The record here illustrated shows that the chart was put on at 8:15 and vehicle operation was as follows:

Truck ran from	Miles
9:45 to 10:37	9½
10:45 to 11:00	3
11:15 to 11:37	4
11:45 to 12:05	2¾
12:15 to 12:35	4½
12:47 to 1:15	5
1:20 to 2:00	7¼
2:15 to 2:35	3
2:45 to 2:55	2
3:05 to 3:22	3½
3:33 to 4:50	14½
5:30 to 5:45	3½

Twelve stops

Truck out of service for 16½ hours and then ran again from 10:15 to 11:08, 9¼ miles, making a total run of 71¼ miles

Average speed, 11 miles per hour

Chart removed at 1:55

Running time, 6 hours and 25 minutes

The recorder has also found a very important use in taxicab service.

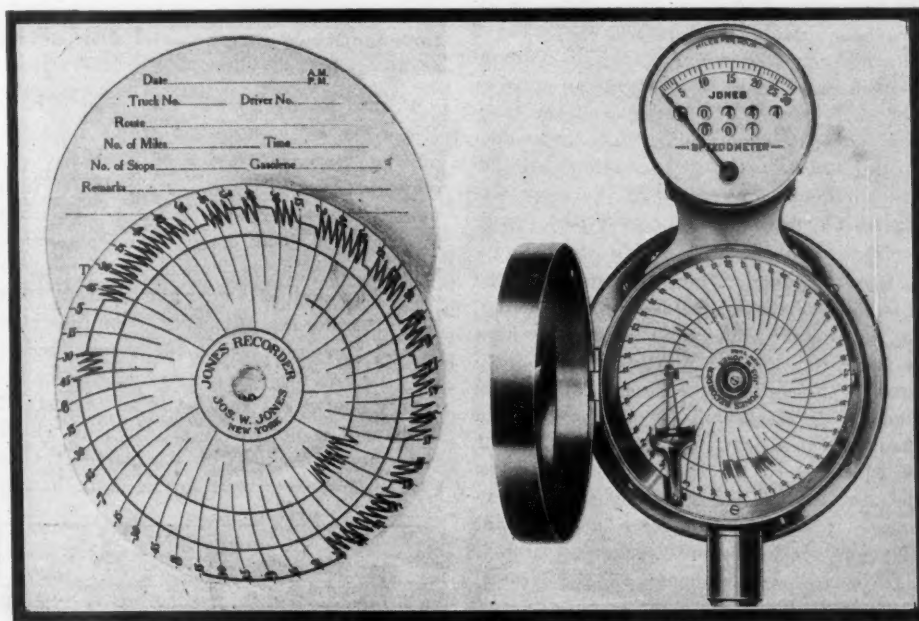


FIG. 5—JONES AUTOMATIC RECORDER AND ONE OF ITS DAILY RECORDS

Among the Makers and Dealers



PLANT OF THE WARNER MFG. CO., OF TOLEDO, WHERE GEARSETS ARE MADE

LAZARNICK in Chicago—N. Lazarnick, the New York motor photographer, has opened a Chicago branch at 509 South Dearborn street, which is in charge of R. V. Corneille.

Gear Works Wins Suit—A jury in the United States circuit court, Indianapolis, has given the Boston Gear Works a judgment on account amounting to \$11,372.50 against the W. H. McIntyre Co., of Auburn, Ind. Suit was brought to collect on motor car gears sold to the Auburn company. The McIntyre company based its defense on the ground that the gears were defective.

Guayule Industry Handicapped.—The guayule rubber industry in Torreon, Gomez Palacio and other Mexican towns is seriously affected by the general labor troubles. More than 10,000 workman of the different industrial plants in Torreon, Gomez Palacio and Lerdo went on a strike the early part of November and the trouble is still unsettled. The Intercontinental Rubber Co.'s production will be much reduced on account of the labor difficulties and the general unsettled conditions.

New Rubber Plant Completed.—The American Tire and Rubber Co., of Akron, O., has completed its plant in the northern part of the city, and will be doing business in the course of a month. Inner tubes and repair stock will be the specialty in the new company's production. The plant is equipped to turn out 500 inner tubes per day and 1 ton of repair stock. The officers of the new concern are: Adam Duncan, president and treasurer; Gilbert C. Waltz, vice-president; F. L. Kryder, secretary. The following constitute the board of directors: Adam Duncan, Gilbert C. Waltz, F. L. Kryder, Harvey Musser,

Gustavus Seiberling, C. M. Wertz, Frank Miller, F. E. Rowe and L. C. Henderson. The capital stock of the company is \$200,000. The company will employ about 150 men.

Denver Chooses March 4-9—Definite arrangements for the annual Denver show have been completed, and under the auspices of Motor Field the big event will be put on at the Auditorium March 4 to 9. Already 14,500 feet of the 15,100 available feet of floor space have been assigned.

Windshield Drawback—The treasury department at Washington has issued an order allowing drawback of duties under section 25 of the tariff act of 1909 on Troy motor car windshields manufactured with the use of the imported plate glass. The drawback allowance is not to exceed the quantity of glass actually contained in each windshield exported.

Primo Straightened Out—The Primo Motor Co., of Atlanta, Ga., for a time one of the most successful of southern car manufacturing concerns, which went into bankruptcy a few months ago, has been re-financed, has been discharged from bankruptcy, after a settlement with creditors on a 25 per cent basis, and expects soon to be turning out 1911 cars. The directors of the company raised the money necessary to get the concern out of the bankruptcy courts and to give it another start. They will soon hold a meeting, at which time new officers will be elected. One of the first acts will be to issue bonds,

which will be taken over by those who put up the money to finance the company. An effort will then be made to sell the remainder of the \$200,000 of stock that it was originally planned to issue.

Havers Increases Capital—Papers have just been filed with the secretary of state at Lansing, Mich., announcing the increase of the capital stock of the Havers Motor Car Co., of Port Huron, Mich., from \$60,000 to \$200,000.

Big Transmission Plant—The Toledo plant of the Warner Mfg. Co., is constructed entirely of reinforced concrete with brick facing and steel supports throughout. All portions of the buildings are of saw-tooth construction with the exception of the offices. The offices comprise about 400 square feet and are finished in matched quartered oak throughout. The factory floor space is 100,000 square feet. The plant has capacity for 1,000 men and is now running both day and night. The annual output is between 40,000 and 50,000 each sliding-gear transmissions and steering gears.

Willys Banquetted—John N. Willys, president of the Willys-Overland Automobile Co., of Toledo, Ohio, was the guest of W. Judson Sprankle, president of the Overland-Marion Motor Car Co., of Philadelphia, at an informal banquet tendered the former in the red room of the Bellevue-Stratford November 23. The object of the entertainment was primarily for the purpose of having Mr. Willys become acquainted with representatives of the Overland company in the Quaker City territory, which embraces eastern Pennsylvania, Delaware, Maryland and Southern New Jersey. Mr. Willys outlined the plans and policy of the company, urging the agents to co-operate in carrying them



out. Short speeches and remarks were also made by Hugh O'Donnell, George M. Graham, J. Winstock, M. W. Jennings, E. S. Edmonson, A. L. Hoskins, George T. Thompson, R. H. Kain and others.

February Date Chosen—The Harrisburg Automobile Dealers' Association, of Harrisburg, Pa., is making plans for its third annual motor car show to be held early in February, following the Philadelphia and New York shows.

Drawback for Goodrich—Instructions have been issued to the collector of customs at New York by the treasury department at Washington to allow drawback under section 25 of the tariff act on motor car tires manufactured by the B. F. Goodrich Co., of Akron, O., with the use of imported leather butts and metal rivets or studs. The usual regulations governing the allowance of drawback on exported articles must be observed to make the instructions effective.

Abbott Plant Growing—The Abbott Motor Co., manufacturer of the Abbott-Detroit, is completing several additions to its Detroit plant. The betterments include extensions of the office building and the chassis assembly department and a two-story addition to the department for final assembly. These add 30,000 square feet of floor space. The company has also installed a more complete sprinkler system and a large water tank, so it is now well protected against fire. The work has been rushed, owing to the demands of the business, and the work is being finished fully 1 month ahead of schedule.

Arousing Hoosier Makers—"Out of the sixty-four pleasure and commercial gasoline vehicles and electrics manufactured in Indiana, only twenty-five have representatives in Indianapolis, the largest city in the Hoosier state, and the city doing the largest business," says H. C. Lathrop, secretary and treasurer of the Henderson Motor Sales Co., general sales agents for the Cole car. As a result of these statistics plans are under way by the Hoosier Motor Club and the Indianapolis Trade Association to induce every Indiana car manufacturer to locate either a salesroom with service department or an office in Indianapolis.

Washington Favors February—Plans are under way for the annual motor car show under the auspices of the dealers of this city. A meeting was held this week, which was attended by thirty-three dealers, representing eighty-five different makes of cars. February 1-7 was the tentative date agreed upon, but the date will not be definitely determined until it is ascertained from certain manufacturers if their cars will be available for show purposes. There is also some question whether Convention hall, which is the only available place in which to hold a show, can be obtained on that date. It was decided to confine the show to pleasure cars, eliminating accessories and motor trucks. This decision

caused a slight row among those who were thus barred from the show, but as the pleasure car dealers were in large majority and as there was every assurance that every inch of space would be taken by them, the decision was allowed to stand.

Ford's November Business—According to officials of the sales department of the Ford Motor Co., the month of November will show an increase of 100 per cent over the same month last year in the way of production. By the end of the month, it is claimed, shipments for the 30-day period will have reached 4,000 cars.

Witt Special the Latest—Studebaker Corporation branches all over the country are exhibiting the new model Flanders 20, known as the Witt Special, so named because it was designed by Frank Witt, the Flanders racing driver, who won the Tiedeman cup Monday. It is a light, racy-looking, two-passenger roadster, with scuttle dash and low, tilted seats. The wheels are 32 inches in diameter, and special features are a large cylindrical tank and a special arrangement of the control system to conform to the low seat of the driver. It was in one of these cars that Witt set a complete list of records for the 160 and under class, for from 1 to 20 miles.

Harmony in Detroit—Practically every Detroit manufacturer of motor cars and no fewer than thirty-five dealers, handling all the best-known cars manufactured in this country, will be represented at the 1912 show of the Detroit Automobile Dealers' Association, to be held in the Wayne pavilion January 22 to 27, inclusive. Above all, it will be a united show so far as present indications go, the friction that resulted in a rival exhibition in the Regal factory last year having been entirely eliminated. The space this year is about 1,000 square feet in excess of that available last year, so the eleventh annual Detroit show will be larger than any of its predecessors.

Premier Building Trucks—One of the surprises of motor show week in Indianapolis was the announcement that the Premier Motor Mfg. Co. will place a line of four-cylinder gasoline trucks on the market. One of the new trucks is now on exhibition in the sales room of the Premier Sales Co. in Indianapolis. The truck is of the 2-ton class and the frame, sub-frame, shafts, torsion rods, transmission differential, driving pinions and rear axle housing are heavier and stronger than in the Premier pleasure cars and the drive is through radius rods instead of through the springs. The brake has a surface of 630 square inches, while the brake surface of the Premier pleasure cars is 526 square inches. Double Goodrich pneu-

matic tires are used on the rear wheels. Any body design will be furnished. The Premier company built trucks several years ago quite successfully, but for the last few years has confined its activities to pleasure cars.

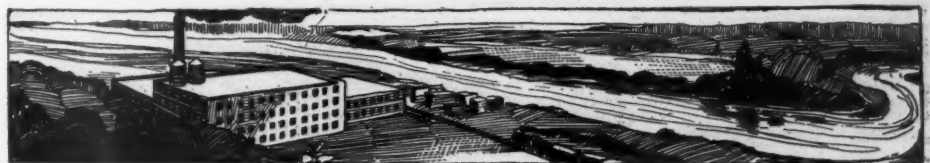
Velie, Jr., a New Model—Major L. M. Fuller and E. H. Sohner, of the Velie Motor Vehicle Co., Moline, Ill., have been in Chicago buying machinery equipment for plant No. 2, of the Velie company, which has just been completed at Moline. At this plant motors both for the commercial and pleasure cars will be constructed and also the new Velie, Jr., car. The new Velie, Jr., is the latest product of the Velie company.

Bonuses for Racers—The Findeisen & Kropf Mfg. Co., of Chicago, paid out \$950 because of the Savannah results. For having a Rayfield carburetor on Mulford, the Vanderbilt winner, received \$500. DePalma, who finished second, got \$200. Hughes, winner of the Savannah challenge cup, was paid \$250.

Whiteside Reorganizes—The Whiteside Motor Truck Co., formerly of Franklin, Ind., has been reorganized and recapitalized and is now located at New Castle, Ind., where it purchased the plant of the Safety Shredder Co. The new plant will enable the company to turn out 1,000 cars per year.

More Mitchell Departments—Three new departments will be established at once by the Mitchell-Lewis Motor Co., of Racine. One will be for the production of commercial vehicles; the second for the manufacture of bodies and the third for the manufacture of tops. Heretofore its bodies have been built in Milwaukee and Racine by outside interests. The line of commercial cars will include a light delivery car and a general utility farm truck. The total production of all cars for 1912 will be 6,000.

Baltimore's Row—The motor industry is making rapid inroads on one of Baltimore's best residential sections, namely, Mount Royal avenue, from Guilford avenue to Druid park entrance. This is particularly the case between Charles and Cathedral streets, where a great portion of the space is taken up with motor car salesrooms, garages and tire concerns. There also are salesrooms and garages along Mount Royal avenue at intervals between the thoroughfares above mentioned, a distance of some eleven blocks. This section can rightly be called Baltimore's motor car row. Most of the other dealers who are not located on this row with few exceptions are only a short distance away.



SPOKANE, WASH.—Harry Bell has added the Mitchell to his line.

Portland, Me.—G. A. Blanchard has taken on the Selden car for this section of Maine.

Wausau, Wis.—The L. H. Hall Co., agent for the Chalmers line for several years, has become exclusive agent for the Kisselkar.

Toledo, O.—H. O. Crist has organized the Crist Motor Sales Co. and will have a salesroom in Toledo, for the sale of Cole cars.

Casper, Wyo.—The Schulte Hardware Co. has been appointed to the local Cadillac agency by Will Hall, the western Cadillac representative in Denver.

Worcester, Mass.—The agency for the Cutting cars has been placed in the hands of the A. G. Gay Co., with headquarters and salesrooms at 102 Commercial street.

Baltimore, Md.—The Thomas car has again entered the Baltimore field. It is being handled by the Oakland Motor Car Co., which also represents the Oakland car and Federal truck, at its new salesrooms and garage, 6 and 8 East Chase street.

Chicago—The Velie Motor Vehicle Co. has absorbed the Velie Motor Car Co. of Chicago, and hereafter will operate as a direct branch. Morton H. Luce, who opened and has been in charge of the New England branch of the Velie company, also will act as manager of the Chicago branch.

Mishawaka, Ind.—The Star garage has been taken over by a new corporation, the capitalization of which is \$5,000. The garage adjoins the Hotel Mishawaka. The officers are as follows: Guy Stutzman, president and superintendent; Louis Slick, secretary and treasurer; Marion Pancake, general manager; Charles Renner, sales manager.

Norwalk, O.—The affairs of the bankrupt Norwalk Motor Car Co. are rapidly being wound up by Trustee A. J. Schur before Referee in Bankruptcy Ben B. Wickham. Recently a sale of the remaining assets of the company was made to the Model Gas Engine Co., of Peru, Ind., the largest individual creditor, its account being something over \$5,000.

Boston, Mass.—W. H. Vinal, who organized the Motor Car Co. of Boston and was president of the corporation, has resigned and disposed of his stock to S. S. Anderson. The Motor Car Co. has the New England agency for the Nance six. Mr. Vinal has not made any plans for the immediate future, but he expects to embark in the motor industry later on with a combined pleasure and commercial

Brief Business

line. L. W. Abbott has been made sales manager of the company.

Kansas City, Mo.—The Great Western Automobile Co. has removed to 1728 Walnut street.

Youngstown, O.—The Motormart has just completed arrangements whereby it secures the dealership in Franklin cars in this territory for the coming season.

Scranton, Pa.—The name of the Penn Auto Co., 515 Mulberry street, the Cole agents, has been changed to the Scranton-Penn Auto Co.

Mondovi, Wis.—R. P. Goddard, Jr., has been appointed local agent for the Jackson and has completed work on a new garage building.

Syracuse, N. Y.—The Velie Motor Co., through the Kerr-Doane Motor Co., of this city, has established the agencies for Velie cars in Norwich, Binghamton, Hornell, Elmira and Ithaca.

New York—The Motor Car Equipment Co., of New York, is opening an uptown branch in addition to its main headquarters at 55 Warren street. The branch is located at 238-40 West Fifty-sixth street, and will be ready for business about December 10.

Boston, Mass.—George L. Sullivan, recently motor editor of the New York Tribune, has joined the sales department of the American Locomotive Co. His activity will be devoted to Alco motor trucks and cars. H. C. Whitney, formerly of the Royal tourist car and the Gramm truck forces, also has connected with the Alco interests as traveling sales representative.

Milwaukee, Wis.—The Smith-Hoppe Auto Co., state agent for the Hupp-Yeats electric and local agent for the Oakland and R. C. H., has moved to its new garage at Wisconsin and Cass streets, erected at a cost of \$45,000. The Wisconsin Auto Sales Co., state representative of the National, Herreshoff, Cutting and Westcott, has also taken quarters in the new garage, which is one of the largest in point of one-floor space in Milwaukee.

Denver, Colo.—G. A. Maxwell and Fred Chamberlin, both of whom were for many years connected with the Feiker Auto Co., of this city, have taken over the western distributing agency of the Haynes car. Walter Fawcett, who operated the agency until recently, has retired from business. The new firm is organized as the Maxwell-Chamberlin Motor Co., and is located in the Fawcett building at 1249-55 Broad-

way, where they have made many improvements in the plant.

Chetek, Wis.—Harry E. Johnson has established a garage here.

San Francisco, Calif.—The Reliance Auto Co., 242-52 Van Ness avenue, has the Lion 40 line.

Wichita, Kan.—The Cole Motor Co. has moved into new quarters at First and Water streets.

Boston, Mass.—The Motor Specialties Co. has discontinued its Boston office and will have all its departments at the Waltham factory.

Victoria, Texas—The Texas Motor Car and Supply Co. has let the contract for the erection of a two-story addition to its machine shops here.

Syracuse, N. Y.—Julian Brown announces that he will soon erect a factory for manufacturing the gas engine recently invented by him. The factory site is not yet selected.

Boston, Mass.—F. W. Hull has secured a renewal for the 1912 Lion line. His new show rooms are located at 289 Congress street. The organization is now styled the Lion Boston Sales Co.

Columbus, O.—The Hudson Sales Co., North Fourth street, has closed sub-agencies as follows: E. O. Fogle Automobile Co., Cambridge, Ohio, Elmore; D. S. Spangler, Thornville, Elmore; R. E. Wildermuth Automobile Co., Pleasantville, Krit.

Omaha, Neb.—The Velie Automobile Co. is erecting a new garage at Tenth and Howard streets, which will be completed early in December. The garage and salesroom recently occupied by the Velie company is now occupied by R. B. Held, dealer in the Lion.

Philadelphia, Pa.—The Philadelphia truck, the newest addition to the commercial vehicle line, was placed on exhibition last week at A. G. Spalding's, Board street above Race. The Philadelphia truck is the product of the Philadelphia Truck Co., which operates a factory at Thirty-ninth and Lancaster avenue, West Philadelphia.

Indianapolis, Ind.—Douglas & Willett, Harrisonville, Mo., have taken on the Cole. The Cole is to be handled in Fond du Lac, Wis., by the Anderson Motor Car Co. Stahl & Stone, of Topeka, Kan., are to handle the Cole at 928 Kansas avenue. J. R. Nowlin, Thirteenth and Joplin streets, Joplin, Mo., will handle the Cole. J. P. McCullom, Carthage, Ill., is a new Cole agent. Dr. A. J. Thornber, of Burlington, Ia., has decided to take the Cole agency for his city. The Spencer Auto Co., Spencer, Ia., has arranged to handle the Cole as a branch of the Cole Motor Co., of Des Moines, Ia. L. E. Ragsdal, of



Announcements

Bedford, Ind., has decided to take the agency of the Cole.

Denver, Colo.—The Carstarpen Electric Co. has taken the Denver agency for the Flanders electric.

Louisville, Ky.—The Louisville Automobile Co., local agent for the Hupmobile, has acquired the agency for the Van Dyke trucks in this territory.

Atlanta, Ga.—The F. B. Stearns Co. will soon open a show room next the Hupp Corporation's new place on North avenue just off Peachtree street.

Kiel, Wis.—The Motor Car Co. of Kiel, incorporated with a capital of \$10,000, will establish a garage and repair shop at once. The concern is negotiating for agency lines.

Indianapolis, Ind.—W. F. Seel, until recently office manager of the Lexington Motor Car Co. of Connersville, Ind., has resigned and terminated his connection with the company.

Detroit, Mich.—Sanderson & Burkhardt, of Buffalo, N. Y., have secured the agency for the Havers six in western New York. The Havers Sales Co. has been organized in Milwaukee, Wis., to handle the Havers six in that state.

Omaha, Neb.—The Powell Supply Co. has taken the agency for Republic tires, for all of this territory. The new building being erected for the company at 2119 Farnam street is rapidly nearing completion.

Kansas City, Mo.—The A. J. Davies Motor Car Co., has removed to 1710 Grand avenue. The Motor Tire and Supply Co. have removed to 1708 Grand avenue. The Karshner Motor Car Co. now is occupying new quarters at Thirteenth and Central streets.

Appleton, Wis.—The Valley Iron Works has made a large installation of the oxyhydric cutting and welding apparatus manufactured by the American Oxyhydric Co., of Milwaukee, and will make a bid for motor car and truck repair work in this territory.

Indianapolis, Ind.—Thomas Marshall, until recently located at Detroit, has been appointed general manager for the United Motors' Indianapolis Co. He succeeded John W. Hayden, who has been obliged to retire on account of ill health, but who expects to return to Indianapolis when he regains his health and engage in business.

Philadelphia, Pa.—Extensive alterations to the showrooms of the W. Wayne Davis Co., local distributor of the Everitt, 600 North Broad street, have been made, and by utilizing the space formerly occupied by the machine shop, the floor space devoted to exhibition purposes has been doubled. The machine shop has been

moved around the corner, on Mt. Vernon street, west of Broad.

San Antonio, Texas—The United States Tire Co. is preparing to open a branch in this city. It will be situated at 433 Main avenue, with Fred D. Welch as depot manager.

Winnipeg—The Breen Motor Co., Cole agent, has moved from 151 Portage avenue to new salesrooms, with service stations at the corner of Broadway and Sherbrooke streets.

Merrill, Wis.—The Lincoln Motor and Machine Co. has been organized here by H. B. Richmond, George Sweet and I. C. Stone. The company has established a garage on Main street.

Elkhart, Ind.—Fred T. Bailey, formerly with the A. W. Harris Oil Co. of Providence, R. I., has been appointed sales manager of the Briggs Mfg. Co., manufacturer of the Briggs magneto.

Baltimore, Md.—The Goodyear Tire Co. is the latest concern to arrange to locate in Baltimore's motor car row. The company is having a residence on Mount Royal avenue near Maryland avenue converted into modern salesrooms.

Fond du Lac, Wis.—The Fountain City garage, erected by M. B. Helmer at a cost of \$25,000, has been opened for business. It is located at 19-21-23 Fourth street, is 40 feet wide and 115 feet long, two stories and basement, of concrete and brick construction.

Baltimore, Md.—The Stoddard-Dayton Auto Co. has taken on the local agency for the Sampson truck. The company will represent the truck not only in Baltimore but throughout Maryland, Virginia and West Virginia, the territory covered by the local company.

Boston, Mass.—Manager Doane, of the Essex Automobile Co., that has the agency for the American line, has leased quarters at 887 Boylston street for new salesrooms, where the Studebaker was formerly handled. The agency will move from Columbus avenue next week.

Boston, Mass.—The Franklin company has decided to give up its branch in Boston and hereafter it will be conducted as an agency. O. A. Lawton, who for some time has been manager of the branch, has decided to take the Franklin on as an agency proposition and for the present he will have his salesrooms at 31 Irvington street. He has the New England territory

and later on will move to some place in the newer motor district.

York, Pa.—The Townsend Auto Co., Easton, Md., has taken the agency for the 1912 line of Pullman cars.

Canton, O.—The A. H. Wilson Motor Car Co., located at 516 North Cleveland avenue, has taken the 1912 agency for the Cadillac and the Detroit electric.

Omaha, Neb.—The Moline Automobile Co. has opened a branch in Omaha, with D. M. Beal as manager. The branch is located at Twentieth and Harney streets.

York, Pa.—S. Kremer Sobrinho, Sao Paulo, Brazil, has become the agent for the Pullman cars in that country and the first shipment of cars was made to the new agent the past week.

Syracuse, N. Y.—It is reported that a factory will shortly be erected for the manufacture of the Hanna self-starter, invented by Charles Hanna, of the J. H. Valentine Co. The factory probably will be built on the north side.

Port Washington, Wis.—The Kraus & Grau Hardware Co. has been appointed Ozaukee county agent for the Cutting, Westcott, Herreshoff and National lines, which are represented in Wisconsin by the Wisconsin Auto Sales Co., 114 Mason street, Milwaukee.

Denver, Colo.—The Mathewson Auto Co., western Reo representative, has appointed the following sub-agents in Colorado: Las Animas, McCune Brothers; Rocky Ford, J. C. Cartwright; Pueblo, Royal garage; Colorado Springs, Paul's garage; Sterling, J. B. Smith; Alamosa, O. P. Sells.

Oshkosh, Wis.—The Termaat & Monahan Co., manufacturing gas and gasoline engines and motors, has purchased the Oshkosh Boat Works site and is erecting a new foundry, to be L-shaped, each wing 50 by 125 feet in size. The present foundry will be added to the machine shops.

Syracuse, N. Y.—The James Auto Co. will during the coming season handle the central New York territory for the Hudson Motor Car Co. The change from dealer to distributor entails a reorganization of the entire sales department in this section, and the James Auto Co. is now distributing agent.

Milwaukee, Wis.—The Milwaukee Auto Specialty Co., 134 Second street, manufacturing storage batteries, windshields, mufflers, lamps, etc., has been incorporated under the laws of Arizona with \$75,000 capital. It is the intention to erect a large building to replace the present cramped quarters. The company succeeded to the business of the General Accumu-



lator and Battery Co. several years ago. Dr. Richard J. Fleischer is president.

Augusta, Wis.—Julius Walthenpuhl has been appointed district agent for the Imperial and is now erecting a garage.

Cherokee, Kan.—Fred and William Chadsey, of Cherokee, are the partners of the Chadsey Mercantile Co., which has arranged to handle the Cole line of cars.

Cincinnati, O.—The Rattermann Motor Car Co. has leased quarters at 1932 West Eighth avenue, and has arranged to distribute the Krit line in southwestern Ohio and northern Kentucky.

Denver, Colo.—William Pete has assumed the managership of the Fry McGill Auto Supply Co., of this city, succeeding John Fry, who is now sales manager for the local Everitt branch.

Moline, Ill.—The Midland Motor Co., manufacturer of the Midland car, has recently appointed the following new agents: Lewis Sales Co., 3950 Olive street, St. Louis, Mo.; Carrigan Brothers, 1006 Olive street, Los Angeles, Cal.; William Easton & Son, Austin, Nevada; Exchange & Implement Co., Price, Utah.

Los Angeles, Cal.—Dr. Green, formerly sales manager of the Cadillac agency in Los Angeles, has taken a position with the Grundy Motor Sales Co., as sales manager for the Cole and Paige-Detroit lines, for which the Grundy Motor Sales Co. is the southern California agent. A. M. Young, who has been sales manager for the Thomas and American cars handled

by the same concern, will retain the same position as heretofore.

St. Louis, Mo.—The Auto Part Sales Co., 2301-2303 Locust street, has opened for business.

Denver, Colo.—The Alkire Motor Car Co. has taken the Denver agency for the Thomas.

St. Louis, Mo.—The Vehicle Top and Supply Co. is moving to a three-story manufacturing building at 3418 Lindell avenue, where Vesco tops will be made.

De Funiak Springs, Fla.—E. V. Meader-nach and L. H. Haghe have started the M. & H. Auto Co., handling the Ford.

Boston, Mass.—Hugh Miller has been made resident manager of the Aristos Co., distributor of the Disco self-starter, with offices and salesrooms at 1002 Boylston street.

Boston, Mass.—A. H. Sowers, formerly with the Welch-Detroit branch in Boston, has joined the sales force of the Jackson agency. Mr. Sowers handled the Jackson in Boston before as a member of the Sowers-Soden Co.

Kansas City, Mo.—By mutual agreement, the Austin & Bacon Mfg. Co., has decided to discontinue the management of the sale of the Diamond tires in this territory. The Diamond Rubber Co. will open a branch house in this city on December 1, at 1316-18 Grand avenue. The branch which will be in charge of John F. Lanier will have control of five states and the

branch houses at Omaha and Oklahoma City.

Syracuse, N. Y.—The Overland Syracuse Co. is to handle the Garford trucks for this section.

Fort Worth, Tex.—Joseph Radcliffe & Sons have opened a garage at Second and Throckmorton streets.

Tacoma, Wash.—The St. Helens garage henceforth will be an exclusive Cadillac agency. The company has heretofore been the agency for both the Cadillac and Winton cars.

Streator, Ill.—The Streator Motor Car Co., of Streator, Ill., has closed with the Crescent garage of Philadelphia, Pa., as distributor for eastern Pennsylvania and also with T. Sidney Weber as distributor for the state of Louisiana.

Baltimore, Md.—Another new car in the Baltimore field is the De Tangle, which is being handled by Callahan, Atkinson & Co., Charles street opposite Pleasant street, who also are the representatives here for the Locomobile.

Worcester, Mass.—The Acme Motor Car Co., a newly incorporated concern under the laws of Massachusetts with a capital of \$40,000 has taken over the motor car sales and repair business of the D. A. Baldwin Co., with headquarters at 22 Commercial street, this city. The new company will act as Worcester and Worcester county agent for the Knox cars and trucks, Martin motor trucks, and the Velie cars, delivery wagons and trucks.

Butler, Pa.—Butler County Auto Co., capital stock \$10,000; incorporators J. Younkens, J. N. Patterson, A. C. Hileman, G. A. Evans, W. J. Rattigan, Ralph Gregg, J. L. Holbein, B. L. Barnhart and A. E. Butler.

El Paso, Tex.—El Paso Auto Co., incorporators W. W. Turner, W. J. Rand and F. S. Gray.

Philadelphia, Pa.—Kirk-Denny Co., capital stock \$5,000.

Punxsutawney, Pa.—Cole Automobile and Transfer Co., capital stock \$10,000.

Indianapolis, Ind.—Pedalmobile Mfg. Co., capital stock \$2,500; directors G. Herff, J. F. Minthorne, A. P. Purcell and P. A. Porteous.

Dallas, Tex.—Oldsmobile Co. of Dallas, incorporators R. E. Paris, R. N. Mosher and C. C. Clark.

St. Louis, Mo.—Curtis Jack and Trust Co., capital stock \$75,000; incorporators J. R. Curtis, H. C. Flunker, A. W. Smith and others.

Chicago—Stevens Motor Truck Co., capital stock \$10,000; incorporators G. P. Stevens, L. F. Stevens and A. M. Stevens.

Chicago—Harder Autotruck Co., capital stock \$100,000; incorporators H. P. Cnadler, J. M. Johnson and K. Cornwall.

Chicago—Empire Auto Top and Supply Co., capital stock \$20,000; incorporators H. Graff, Jr., A. N. Charles and J. E. Bullard.

Cincinnati, O.—Fischer Auto and Service Co., capital stock \$30,000; incorporators A. G. Fischer, H. J. Guckenberger, G. C. Bauer, G. Guckenberger, Jr., and W. M. Fleming.

Madison, Wis.—Motor Car Co., capital stock \$15,000; incorporators F. Thieson, P. Jugenheimer and W. A. Duecker.

Plaquemine, La.—Plaquemine Motor Car Co., Ltd., capital stock \$10,000; incorporators Dr. W. A. Halloway, Henry Nadler and E. B. Schwing.

Frederick, Md.—Ideal Garage Co., capital stock \$30,000; incorporators G. H. Sraley, E. B. Ramsburg and others.

St. Joseph, Mo.—Buchanan Auto Co., capital stock \$2,000; incorporators E. T. Wells, A. K. Burger and C. C. Rhodus.

Gastonia, N. C.—Gastonia Garage Co., capital stock \$2,000; incorporators A. G. Myers, J. C. Rankin, W. H. Adams and others.

Memphis, Tenn.—Tri-State Auto Co., capital stock \$1,000; incorporators J. F. Higman, R. L. White, R. G. Brown and others.

Recent Incorporations

Norfolk, Va.—Virginia Automobile Garage and Repair Corp., capital stock \$10,000; incorporators H. L. Page, A. M. Bopp and P. A. Page.

Charleston, W. Va.—Kanawha Auto Truck Co., incorporators W. S. Roberts and D. S. Gunther.

Washington, Pa.—American Tire and Filler Co., capital stock \$200,000; to manufacture and deal in motor cars; incorporators J. S. Forsythe, F. C. Lewis, H. J. Johns, R. D. Forsythe and E. W. Rolfe.

Charleston, O.—Collison-Pierson and Co., capital stock \$25,000; incorporators J. F. Collison, D. R. Pierson, W. S. Taylor, O. H. Ashley and A. B. Koontz.

Ft. Wayne, Ind.—Merchants Motor Delivery Co., capital stock \$25,000; incorporators A. W. Harris, W. Hahn and A. H. Fernwalt.

Boston, Mass.—Fothergill Motor Co., capital stock \$100,000; incorporators R. B. Skinner and A. C. York.

Dubuque, Ia.—Dubuque Rambler Auto and Supply Co., capital stock \$20,000; incorporators A. Frater, B. M. Fitzgerald and W. E. Ellwanger.

Toledo, O.—Moore Motor Truck Co., capital stock \$10,000; to manufacture motor cars; incorporators D. W. Bliss, M. M. Bliss, E. L. Skidmore, C. H. Rauch and F. E. Moore.

Carrollton, O.—Carrollton Rubber Co., capital stock \$10,000; incorporators H. J. Richards, J. H. Richards, J. R. Williams, J. C. Oglevee and W. H. Miller.

Cincinnati, O.—Auto Accessories Mfg. Co., capital stock \$15,000; to manufacture accessories; incorporators S. C. Bottinger, A. L. Habekotte, W. Strichteneth, W. D. Paxson and H. E. Beebe.

Toledo, O.—Royal Auto Co., capital stock \$1,000; to deal in motor cars; incorporators M. M. Kennedy, E. B. Parker, B. C. Christen, E. J. Heise and E. M. Warnke.

Detroit, Mich.—Visible Spark Plug Co., capital stock \$10,000.

New York—Wishart-Dayton Auto Truck Co., capital stock \$25,000; to manufacture motor cars; incorporators R. A. Inch, S. E. Wishart and J. B. Smith.

Buffalo, N. Y.—Pierce-Arrow Sales Co., capital stock \$75,000; to deal in motor cars; incorporators W. J. Minehan, T. D. Powell and H. W. Huntington.

Newark, N. J.—Lenox Motor Car Co., capital stock \$25,000; general motor car business; incorporators L. Lippman, J. M. Shreffler, M. Lippman and C. Shreffler.

Buffalo, N. Y.—Herkimer Garage Co., capital stock \$10,000; to operate garage; incorporators R. J. Conover and L. K. Jillson.

Boston, Mass.—Motor Cab Co., capital stock \$1,000; incorporators O. E. Lawler, L. J. Dunne and Harold D. Cushman.

Boston, Mass.—Fothergill Motor Co., capital stock \$1,000; incorporators R. B. Skinner, A. Chesley, A. L. Thomas, E. F. Gardner and L. A. Brimmer.

Worcester, Mass.—Macker Motor Co., capital stock \$16,000; incorporators M. A. Macker, L. E. Bragg and R. S. Smith.

Worcester, Mass.—Acme Motor Car Co., capital stock \$40,000; to deal in motor cars; incorporators W. Vincent, E. D. Wheeler and A. D. Watson.

Springfield, Mass.—Corson Auto Co., capital stock \$15,000; to deal in motor cars; incorporators H. E. Corson, F. H. Chapman and H. K. Smith.

Springfield, Mass.—Western Massachusetts Cadillac Co., capital stock \$10,000; to deal in motor cars; incorporators E. R. Clark and R. A. Knight.

Chicago—Acme Automatic Tire Pump Co., capital stock \$50,000; to manufacture accessories; incorporators F. J. Carroll, E. R. Rosenthal and F. J. Houlihan.

Richmond, Va.—Broad Street Garage, capital stock \$5,000; incorporators A. Zachary, O. B. White and C. Stokes.

Indianapolis, Ind.—General Specialty Co., capital stock \$40,000; to manufacture tires; incorporators C. R. Gregg, R. E. Gregg, W. W. Gregg and J. W. Coulter.

Philadelphia, Pa.—Pullman Automobile Co., capital stock \$25,000; general motor car business; incorporators O. M. Parke, H. E. Grant, G. C. Keppelman, Dr. M. W. Bachman and W. L. Garland.



Legal Lights and Side Lights

PERTINENT POINT RAISED

MARYLAND motorists of this section are interested in a decision which Judge Harlan, of part 2 of the criminal court, Baltimore, will render within the next few weeks concerning the constitutionality of a certain section of the Maryland motor vehicle law. Attorney Harry B. Wolf made the contention that that section of the law requiring a driver of a motor vehicle to give his name and address to those who ask him in the case of a collision is unconstitutional. The case came before Judge Harlan on an appeal from a police magistrate who fined Ernest Case \$25 and costs on the charge of violating this section of the law. As a basis for his contention Mr. Wolf cited the provisions in the constitution of the United States and the bill of rights of Maryland. He argued that the section requiring a driver to return to the place of collision and give his name and address and license number is in effect the same as requiring that person to give evidence which would tend to incriminate him. Judge Harlan reserved his decision.

PRISON FOR RECKLESS DRIVER

Judge White, of the Massachusetts superior court, sounded a warning to reckless drivers of motor cars when he imposed a sentence of 3 years at hard labor in the house of correction on Edwin H. Hancock, of North Attleboro, who was convicted by a jury on a charge of manslaughter for causing the deaths of George Hunt and Lottie Thomas last April. Judge White was importuned to impose a fine in the case, but he refused. He said that he had given careful consideration to the testimony concerning the defendant's high reputation; that the citizens who came from North Attleboro to ask for clemency were all known to him, and in fact that two of them were relatives of the judge. Yet in spite of all this he said that it was time that an example should be made of some one and that he could not conscientiously impose a fine, as he felt that the case called for a prison sentence.

The judge said that 30,000 or more cars are being operated in Massachusetts and that the feeling was very prevalent that everybody should make way for the owner of the motor car, which was a mistake, as far more regard should be paid to pedestrians. He said he proposed by the disposition of the Hancock case to make an impression upon the motorists of Massachusetts and the public at large.

The sentence was somewhat of a surprise, as it was believed that with so many asking for clemency that Hancock might be fined instead of imprisoned, but there has been so much reckless driving in the Bay State of late that the judges seem to have felt it is time it should be checked, and even the lower court justices are said to be ready to sentence offenders.

In the Hancock case the defendant was driving along at night and he struck the young people, who were out for a stroll. They were about to be married, which made the case all the more prominent and engendered animosity in Bristol county against motorists. The prosecution contended that Hancock was under the influence of liquor and that his car was not properly lighted.

MARYLANDERS AROUSED

President H. M. Rowe, Secretary H. M. Luzius and other prominent members of the Automobile Club of Maryland are loud changes in the motor car tax and registration of chauffeurs and other drivers which Commissioner of Motor Vehicles John E. George intends to ask the next legislature to adopt.

Mr. George wants to increase the state's receipts by increasing taxes and having yearly registrations instead of one registration for drivers being permanent. Dr. Rowe said that any further tax on motor cars would be an imposition. In fact, he calls the present law an imposition because, he contends, it and the fact that motorists also have to pay personal taxes makes it necessary to pay double taxation and is clearly unconstitutional according to many lawyers.

"We submitted to an increased tax 2 years ago," declared Dr. Rowe, "because we were promised good roads. Yet we have not a single trunk line out of Baltimore and we have no assurance that there will be for some time to come. Let the state complete a few of its proposed roads before it asks for more money from motorists in its attempt to continue what falls little short of being a public holdup. I am sure that the club with its 800 members will not view Commissioner George's view favorably."

IMPORTANT TO DEALERS

What is regarded as an unusual and very important legal case and which will be watched closely by all the men in Boston who handle cars on an agency basis is the suit for \$30,000 damages that has just been brought by the White, Ware & Leatherbee Co., of 895 Boylston street, Boston, against the Louis J. Bergdoll Motor Co., of Philadelphia, maker of the Bergdoll cars. The suit is based on the alleged failure of the Bergdoll company to deliver

cars on time as specified in contracts and thereby injuring the plaintiff's chance to dispose of their machines.

The Boston dealers claim that the Bergdoll company unreasonably delayed the cars that were to be delivered to them for demonstrating purposes and also delayed the delivery of cars that had been sold so that when they did arrive the purchasers refused to accept them. The case will be heard in the civil session of the superior court in Boston.

Judge Pierce, of the superior court, was asked to issue an injunction against the National Shawmut Bank and the Boston and Albany Railroad restraining them from returning two cars to the Bergdoll company that recently arrived in Boston. The judge issued a temporary injunction and the case will be heard later relative to making the injunction permanent.

Meanwhile all the Boston dealers are watching the trend of events, for this is the first time that an agency has had the temerity to make any such legal protest against the makers, and should the White, Ware & Leatherbee Co. be successful in its suit it may have a tendency to improve conditions and prevent makers from accepting deposits for cars that they know they never can deliver at the time the contract calls for them.

CHIEF SETS A TRAP

It has just been discovered that the police department of Lynn, Mass., is making a practice of sending out notices to motorists whose numbers have been secured, notifying them that the chief of police would like to have them call at his office in relation to certain complaints. Naturally the motorists visit the police chief and finding him affable detail the circumstances under the belief that it is merely a case of being advised to be more careful in future. The next thing they know they are served with a summons to appear in court and the chief has the evidence in the form of the testimony of the accused made in the presence of several officers and there is no dodging the outcome. As a result conviction follows. The Bay State law compels a driver to give information when he is handling a car, but not at other times. However, the drivers do not know this, but the matter of not being obliged to furnish evidence against themselves is being made public now so the police chief's little scheme of "walk into my parlor said the spider to the fly" will be broken up.





The Motor Car Repair Shop

THE subject of repairshop equipment is an ever interesting one at this time inasmuch as there are so many garages throughout the country which either are contemplating the installation of machine tools or additions to the equipment which they now possess. In the illustration, Fig. 1, which shows a section of the Stoddard-Dayton repairshop, Chicago, many interesting and useful features of repairshop equipment are shown. In the background of the photograph showing one corner of the shop the blacksmith's forge and forging outfit are located. In front of the windows there is a long workbench with the vices arranged at convenient intervals and in such positions that the light from the windows will be directed onto the vices while the vices themselves still are not directly in front of them. A commendable feature of this shop arrangement is that all of the machine tools are driven from a single line of shafting driven by an electric motor of about 2 horsepower. The machine tool equipment comprises: a small drill D which is shown just in front of the blacksmith's outfit, an air blower B for the brazing outfit, a very small high speed drill E, a large drill press F, and a fairly large sized lathe, part of which is shown in the other illustration, Fig. 2.

In addition to the machine tool equipment there is an arbor press A, conveniently located but still in an out-of-the-way position. There also is a portable crane C, whose services are practically indispensable. Attention is called to the iron sling which is used for gripping the motor



FIG. 2—OPPOSITE CORNER OF SHOP SHOWN IN FIG. 1

suspended from this crane. Devices of this kind are a most desirable article of repairshop equipment in that they are quickly applied and do not crush or damage the more delicate parts of the motor as often is done when chains or rope is used for the purpose. Other commendable features of the equipment of this shop are the adjustable and substantial motor stands employed. These are best shown in Fig. 2, the engine on the one in the background being shown in the upright position and the one to the right of it in an inverted position desirable when working on the crankshaft bearings. Either of these positions are obtainable without lift-

ing the motor from the stand, the side rails being pivoted.

Attention also is called to the workbench in the foreground at the left of Fig. 2. It is a substantial structure, with a vise at one end of it. The lower portion is equipped with drawers and built in to form a cabinet for lathe tools, extra lathe parts, and other articles employed by the workmen who use the lathe. The lathe, which is shown behind this workbench, is used extensively for the purpose of dressing down, smoothing and truing up the bearing surfaces of motor crankshafts; this operation was being performed just before the photograph was taken.



FIG. 1—THE STODDARD-DAYTON REPAIR SHOP, CHICAGO, SHOWING MANY EXCELLENT FEATURES OF THE EQUIPMENT